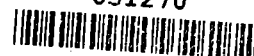


**South Site Remediation  
Findings/Remedial Action Report  
Lenox China  
Pomona, Atlantic County, New Jersey**

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**South Site Remediation  
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Prepared By:  
John F. Kinkela  
Lenox Technical Services  
Pomona, NJ

## **TABLE OF CONTENTS**

1. INTRODUCTION
2. REMEDIAL ACTION DESCRIPTION
3. SOURCE REMOVAL
4. SAMPLING AND ANALYSIS
5. DECONTAMINATION
6. SOIL PROCESSING
7. PIT DEWATERING, WATER TREATMENT AND DISPOSAL
8. GROUNDWATER SAMPLING
9. CONCLUSIONS

### **TABLES**

- Table 1 - Hazardous Waste – Off-Site Shipments
- Table 2 - Recycle Materials
- Table 3 – Post Excavation Soil Results
- Table 4 – Certified Laboratory Results
- Table 5 - South Site Water Sampling

### **FIGURES**

- Figure 1 - Site Location Map
- Figure 2 - Site Map
- Figure 3 - Grid Sample Locations and Results

### **APPENDICES**

- Appendix A - Permits
  - RAWP
  - Pinelands Certificate of Filing
  - ACUA Approval Letter
- Appendix B - Expedited Field-test Procedure
- Appendix C – Geo-probe Analytical Results and Methodology

## 1. INTRODUCTION

The South Site is located directly south of the Lenox China (Lenox) facility on Tilton Road in Pomona, Galloway Township, Atlantic County, New Jersey. The South Site is not a part of the Lenox Facility, rather it is an approximately one acre tract of land which is contiguous to the Lenox facility as shown in Figure 1 - Site Location Map. A Remedial Action Work Plan (RAWP) was submitted to and approved by the New Jersey Department of Environmental Protection (NJDEP) prior to the start of remedial activities in October 1996. The site was included in an amendment to the Memorandum of Agreement, Case #: 95-6-29-0905-37, dated December 9, 1996 covering remedial work at the facility. A Pinelands Certificate of Filing for the project was received January 2, 1997. Temporary approval to discharge water, from dewatering the pit, to sewage, was issued by the Atlantic County Utilities Authority (ACUA) with the concurrence of the Township of Galloway, Municipal Utilities Authority, and the NJDEP Department of Water Quality (DWQ). Copies of the RAWP, Amendment to the Memorandum of Agreement, Pinelands Certificate of Filing, etc. ACUA Approval Letter are included in Appendix A.

This report was prepared in accordance with NJAC 7:26E-6.6 - Remedial Action Report. Lenox has completed clean closure of the South Site as shown in Figure 2 - Site Map in accordance with the work plan approved by the NJDEP (see Appendix A).

## 2. REMEDIAL ACTION DESCRIPTION

Remedial action at the South Site consisted of the excavation and off-site disposal of soil/china materials excavated from the Pit/Dredge Area as shown in Figure 2. The materials were removed utilizing an excavator and/or loader. Excavation continued until unaffected (non-china containing) soils were encountered. Initially materials were excavated and loaded into eight lined and covered roll-off containers and stored on Lenox property pending laboratory analysis. Based on the laboratory results, the excavated materials were disposed/recycled at appropriate off-site facilities as described in 3. SOURCE REMOVAL below. Subsequently, all materials excavated were either stockpiled on a temporary storage pad or stockpiled within the excavation and loaded directly onto trailer trucks for transportation.

The remaining remedial action at the South Site consisted of removal of the china chips and recyclable materials from soil in the Flat Area shown in Figure 2. These materials were removed utilizing soil screening equipment. The china chips and recyclable materials removed were disposed/recycled at an appropriate off-site facility.

Remedial activities were verified through the collection and laboratory analysis of soil confirmation samples. The number and location of the final confirmation samples were as shown in Figure 3 - Grid Sampling Locations and Post Excavation Results. Wherever surficial samples indicated that remaining soils had total lead levels above the New Jersey

Residential Direct Contact Soil Cleanup Criteria (RDCSCC) of 400 mg/Kg, additional soil was removed followed by a second round of confirmation samples.

The soils at the South Site consist primarily of relatively high permeability sand. The site is generally flat. Therefore, it was not anticipated that surface water runoff would pose a problem. In fact, surface water runoff from the Plant and areas around the South Site were being directed to a drainage swale on the South Site where it infiltrated into the groundwater. Considering these conditions, final erosion and sedimentation control for the remedial action consisted of grading from the margins of the site to a central depression with supplementary seeding and mulching, as required.

### **3. SOURCE REMOVAL**

A significant amount of the soil in the Pit/Dredge Area, as shown in Figure 2, (ultimately 8,600 tons) was determined not suitable for screening and/or recycle. It was excavated and manifested off-site to permitted TSD Facilities for treatment and landfill disposal. This was determined by sampling, field-testing and, eventually, by obvious appearances. First, grade level, overlying soils, containing broken china, molds and other Lenox materials, were stripped and stockpiled in the Flat Area for further evaluation and processing. Second, unsuitable soils were excavated until the bottom and all edges of the original Pit were encountered. Table 1 - Hazardous Waste - presents a listing of all hazardous wastes sent to TSD Facilities. Table 2 - Recycle Materials - Shipped Off Site presents a listing of the non-hazardous materials sent for recycling.

### **4. SAMPLING AND ANALYSIS**

Samples were taken at the NJDEP approved grid points, as shown in Figure 3, at various depths in order to establish at what depth clean soil existed. (Clean soil is defined as soil, which has a total lead concentration less than the RDCSCC criteria of 400 mg/Kg.) Where there were no overlying industrial residues, the grade level grid point samples were sent to an outside, certified laboratory for analysis using an approved method per the New Jersey Technical Regulations. The remainder of the grid points were sampled after removing overlying soils and homogenizing the underlying soils. These results are presented in Table 3 - Post Excavation Soil Results and Figure 3. All analytical results presented in this report are from ACCU-Test Laboratories, Dayton, NJ. In compliance with N.J.A.C.7:26E-2.1, the data in Table 3 is also being submitted in Electronic GIS Format on the 3.5" disketts included in this report.

An expedited field-test procedure (see Appendix B) for total lead was routinely performed to evaluate samples taken for process control and before any samples were sent to ACCU-Test for certification. The Lenox laboratory performed numerous field tests on samples throughout the course of this project in order to expedite the clean-up. The results of this analytical work are not presented in this report, as the expedited procedure employed by the Lenox laboratory was not an approved standard method. Field test results have been retained along with other documentation of the work (photographs, workplans, pile

locations and daily logs) and are available for inspection at Lenox Technical Services in Pomona, NJ.

As reported to the New Jersey Department of Environmental Protection, approximately seven cubic feet of a black asphaltic substance was found during the course of the excavation. Analysis by an outside, certified laboratory showed that this material contained low levels of trichloroethylene (TCE), at 8420000 ppb (<1%). This substance was segregated from all the other soils and eventually sent to a hazardous waste incinerator for disposal. The hazardous waste manifest information is presented in Table 1. ?

## 5. DECONTAMINATION

Once the depth and appearance of clean soil were determined, excavation of remaining soils, exceeding the RDCSCC, proceeded. The excavated soil was placed in various stockpiles on the site, at grade level, for further processing. All areas on the grid, where soils were removed, were resampled at the agreed sampling points. These analytical results are included in Table 3 and Figure 3. Note that due to concerns about the uniformity of the interface soils, four samples were taken within a one-foot radius of the agreed sample point. One of the four samples was arbitrarily selected for analysis. As agreed in advance with the NJDEP Case Manager, if any sample was found to indicate a hot spot, the three remaining samples would be separately analyzed and the results averaged. As no one sample ever exceeded the maximum value allowed by the New Jersey Technical Requirements for Site Remediation, N.J.A.C. 26:E, none of the remaining three samples was ever analyzed. However, for various reasons, duplicate sets of samples were taken and analyzed for some of the points. All certified analysis results for each point are presented in Table 3 and the average value is shown in Figure 3.

Due to the necessity to dewater areas during excavation (where either the bottom of the pit was at or below the high ground water levels and/or the need to sequentially excavate and re-bed lengths of two large utility pipes which cross the site) some areas were over-excavated to the clean soil depths that had been previously determined by sampling. Before backfilling, these excavated areas were representatively sampled and composited for analysis. Then the area was immediately backfilled and compacted with either clean soil from off-site or processed soil, which had been previously certified to meet the RDCSCC. NJDEP representatives witnessed this procedure on July 7, 1997 for the major portion of the utility pipes.

Recyclable materials, that were screened from the excavated soils, were sampled and tested to determine the level of soil removal required to assure that they met the RDCSCC criteria. This was achieved by drying the sample to remove physical water, placing the material into a rubber lined jar mill and rolling the mill until all of the remaining soils had been removed. The materials were then screened by hand to remove the loose soil. The two fractions were weighed. The soil was sampled and analyzed for total lead. The mass of the total lead in the soil was calculated and compared to the total weight of the two

fractions to determine if the as screened material met the RDCSCC criteria before sending the material for recycle.

A temporary Materials Storage Area and a Truck and Equipment Decontamination pad were constructed as shown in the RAWP. These facilities were decontaminated, the liners removed and disposed and the facilities dismantled. Samples were taken from the underlying soils and composited for each facility to demonstrate that no release had taken place. This data is included in Table 4 – Certified Laboratory Results.

## **6. SOIL PROCESSING**

Initially, stockpiled soils were visually inspected to determine whether screening could possibly reduce the lead content to below the RDCSCC for ultimate placement on the South Site - and/or - to reduce the volume of impacted material by separating out recyclable construction debris (logs, lumber, bricks, concrete and asphaltic concrete) and other clean materials for recycling to concrete aggregate and highway sub-base facilities. If at this or any later processing stage, the RDCSCC criteria could not be efficiently achieved, those soils were manifested to TSD Facilities.

After selected soil stockpiles were processed by screening, they were sampled and field tested to determine whether screening had achieved the RDCSCC criteria or if further processing would efficiently achieve levels below the RDCSCC. In order to produce a uniform sample for analysis, the processed soil was spread on a clean surface and homogenized in-place prior to final sampling. Soils, which met the RDCSCC, were stockpiled on-site. After certification of the sample by the outside laboratory, the soil was eventually placed back on the South Site. Table 4 includes these certified soil test results. Only soil which met the RDCSCC criteria was placed on the South Site.

## **7. PIT DEWATERING, WATER TREATMENT AND DISPOSAL**

Prior to proceeding with the remediation, stormwater from the plant and grounds was diverted, by means of a large trench as shown on Figure 2, to the existing 100-year flood, stormwater containment dike to the north at the back of the plant property. However, it was still anticipated that surface and ground waters from the South Site, itself, would collect in the remedial excavation area. In order to remove water from the remedial excavation during the course of the work, two water collection sumps were excavated in the existing swale. A pumping, pH adjustment, chemical additions and final filtration station was constructed on the plant end of the site and a metered discharge line was connected to an existing plant sewage lift station.

A temporary permit was obtained for connection of this discharge to the ACUA sewage collection and treatment system. The permit included limitations on daily discharge volumes, duration of discharge, pH, total suspended solids (TSS) and total lead. Composite samples were taken and analyzed daily during pumping and the volume, pH,

TSS and lead results were reported daily to ACUA (see Table 5 - South Site Water Sampling).

During the deepest remedial excavation and decontamination of the soils and gravel surrounding the sump areas prior to backfilling and abandoning the sumps, it was necessary to pump and contain a larger volume of water than could be treated and discharged in any one day under the permit. ~~A temporary earthen dike was constructed over the utility pipelines to the north of the site and double lined to contain the water.~~

Using large trash pumps, groundwater was successfully removed for the final excavation and decontamination of the remedial excavation. Water in the temporary containment was treated and discharged to sewage. The temporary containment was washed clean, the liners removed and the earthen dike removed. The underlying soil was sampled and tested to confirm that no release had occurred.

## **8. GROUNDWATER SAMPLING**

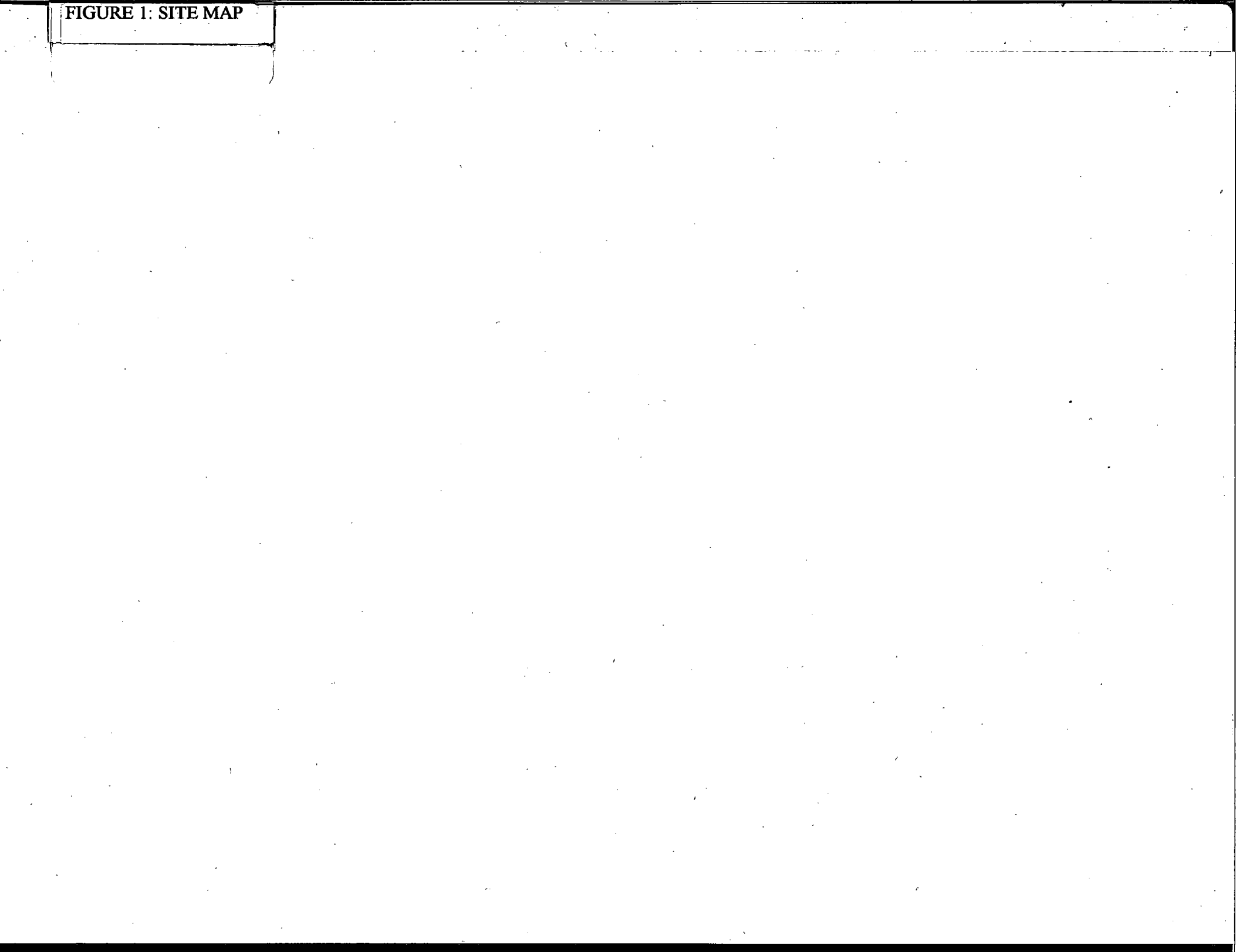
When the remediation work had been completed, four Geo-probe wells were temporarily placed and sampled at the locations shown on Figure 3. NJDEP representatives were on site to witness the groundwater sampling. All results of this sampling were below 1 ppb for TCE and 10 ppb for lead. The analytical results and methodology are reported in Appendix C.

## **9. CONCLUSIONS**

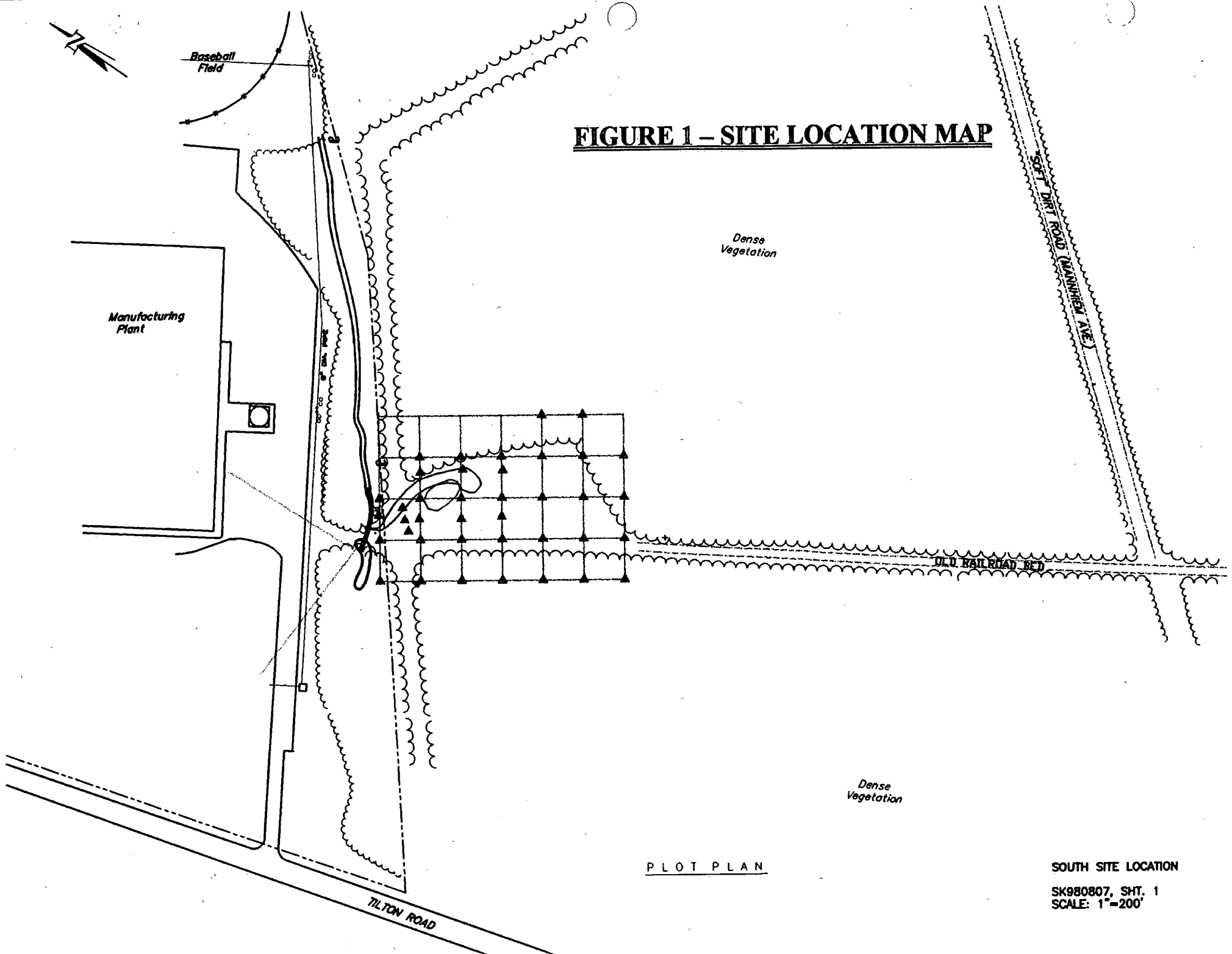
- The results shown in Table 3 clearly demonstrate that all contaminated materials were successfully removed to below the RDCSCC level and that the underlying soils meet the RDCSCC criteria.
- The results shown in Table 4 clearly demonstrate that all processed soils placed on site were certified by the outside laboratory to meet the RDCSCC criteria.
- The results shown in Appendix C clearly demonstrate that groundwater at the site has not been impacted.



FIGURE 1: SITE MAP



**FIGURE 1 – SITE LOCATION MAP**



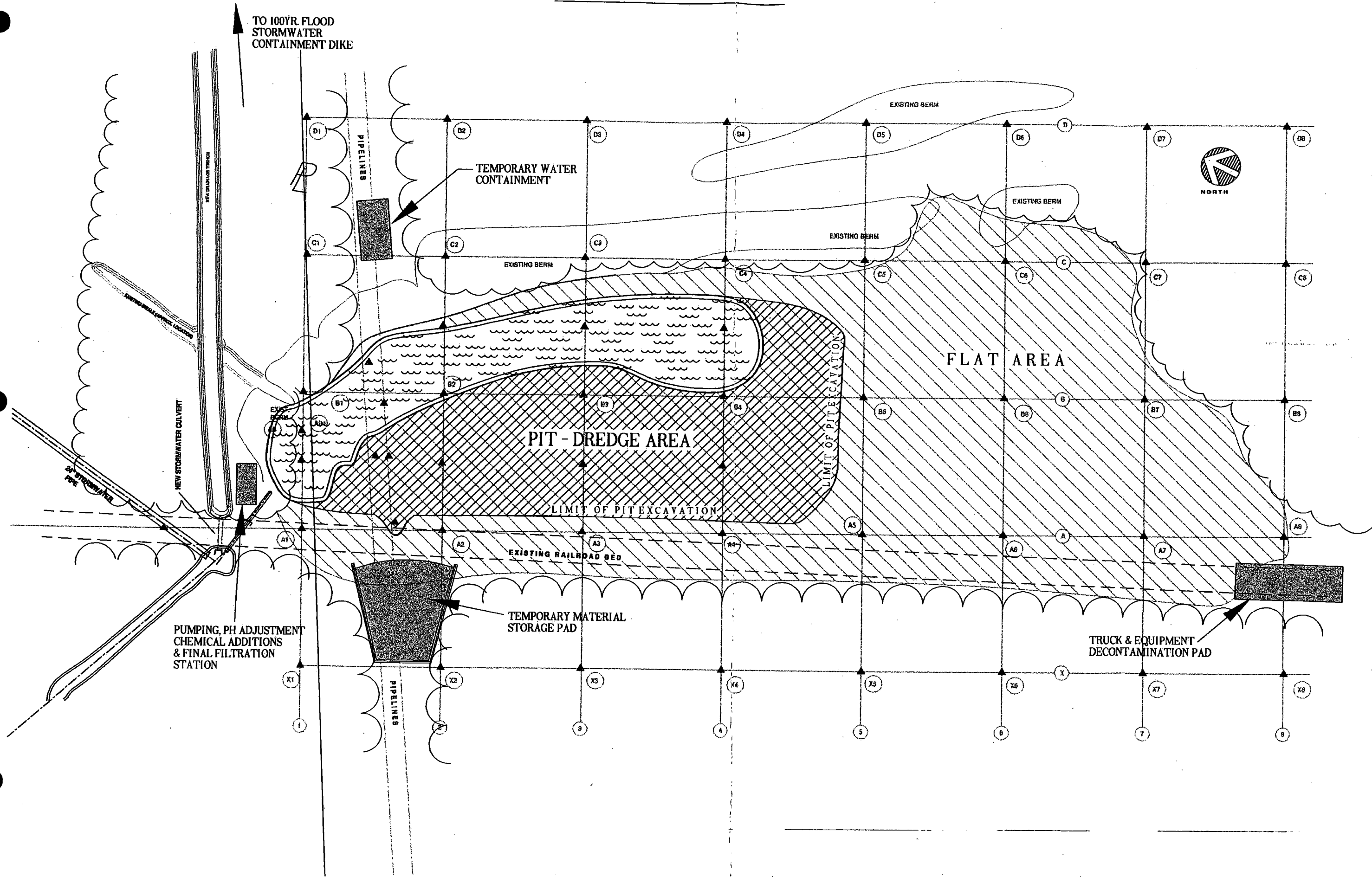
PLOT PLAN

SOUTH SITE LOCATION

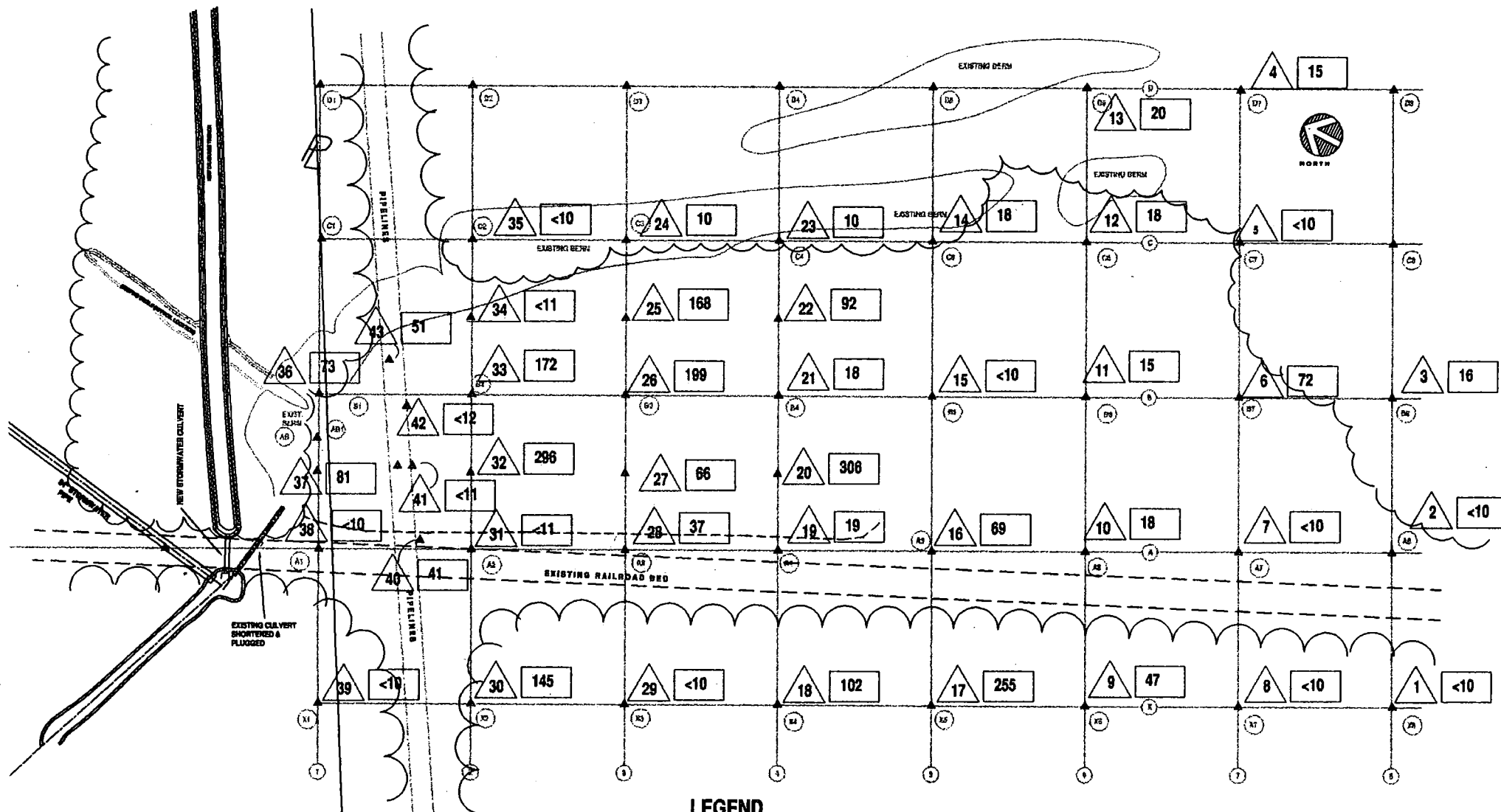
SK980807, SHT. 1  
SCALE: 1"=200'

**FIGURE 2: SAMPLE  
LOCATIONS**

**FIGURE 2 - SITE MAP**



# GRID SAMPLE LOCATIONS & POST EXCAVATION RESULTS



## LEGEND

▲ -GRID POINT INTERSECTION

△ -CLEARANCE SAMPLE LOCATION

□ -CLEARANCE SAMPLE RESULT, AVERAGE in mg/Kg (PPM)

⊙ -GRID POINT NUMBER

TABLE 1: MANIFESTS

**TABLE 1. HAZARDOUS WASTE - OFF SITE SHIPMENTS**

STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT	COMPANY	DATE	IN TONS	TRANSPORTER
NYB 5067288	96010	CWM	10/23/96	18.08	FREEHOLD CARTAGE, INC.
NYB 5067297	96010	CWM	10/31/96	18.39	FREEHOLD CARTAGE, INC.
NYB 8733321	96011	CWM	11/4/96	18.61	FREEHOLD CARTAGE, INC.
NYB 8733411	96014	CWM	11/7/96	16.98	S & J TRANSPORATION
NYB 8733339	96015	CWM	11/8/96	18.43	S & J TRANSPORATION
NYB 8733357	96016	CWM	11/18/96	17.21	S & J TRANSPORATION
NYB 8733348	96017	CWM	11/18/96	17.21	S & J TRANSPORATION
NYB 8733366	96011	CWM	11/20/96	17.29	S & J TRANSPORATION
NYB 2688210	97015	CWM	02/12/97	22.69	S & J TRANSPORATION
NYB 2688228	97016	CWM	02/12/97	22.48	S & J TRANSPORATION
NYB 2688273	97017	CWM	02/13/97	21.21	S & J TRANSPORATION
NYB 2688930	97019	CWM	02/24/97	22.67	S & J TRANSPORATION
NYB 2688912	97020	CWM	02/24/97	22.81	S & J TRANSPORATION
NYB 2688714	97021	CWM	02/24/97	21.71	S & J TRANSPORATION
NYB 2688921	97022	CWM	02/25/97	22.49	S & J TRANSPORATION
NYB 2688957	97023	CWM	02/25/97	21.96	S & J TRANSPORATION
NYB 2688948	97024	CWM	02/25/97	22.18	S & J TRANSPORATION
NYB 8773209	97018	CWM	02/26/97	23.31	BUFFALO FUEL CORP.
NYB 8773191	97025	CWM	02/26/97	23.84	BUFFALO FUEL CORP.
NYB 8773218	97026	CWM	02/26/97	22.37	S & J TRANSPORATION
NYB 8773236	97027	CWM	02/26/97	21.22	S & J TRANSPORATION
NYB 8773182	97028	CWM	02/27/97	20.67	BUFFALO FUEL CORP.
NYB 8773227	97029	CWM	02/27/97	22.22	S & J TRANSPORATION
NYB 8773146	97030	CWM	02/28/97	22.95	S & J TRANSPORATION
NYB 8773128	97031	CWM	02/28/97	22.62	BUFFALO FUEL CORP.
NYB 8773173	97032	CWM	02/28/97	22.13	S & J TRANSPORATION
NYB 8773038	97033	CWM	03/03/97	22.72	S & J TRANSPORATION
NYB 8773002	97034	CWM	03/03/97	22.58	BUFFALO FUEL CORP.
NYB 8773029	97035	CWM	03/03/97	22.78	S & J TRANSPORATION
NYB 8773011	97036	CWM	03/04/97	25.26	HORWITH TRUCKS, INC
NYB 8772993	97037	CWM	03/04/97	24.05	HORWITH TRUCKS, INC
NYB 8772975	97038	CWM	03/04/97	26.10	HORWITH TRUCKS, INC
NYB 8772966	97039	CWM	03/04/97	21.96	HORWITH TRUCKS, INC
NYB 8772957	97040	CWM	03/04/97	23.81	HORWITH TRUCKS, INC
NYB 8772858	97041	CWM	03/05/97	25.73	HORWITH TRUCKS, INC
NYB 8772849	97042	CWM	03/05/97	23.21	BUFFALO FUEL CORP.
NYB 8772831	97043	CWM	03/05/97	24.34	BUFFALO FUEL CORP.
NYB 8772822	97044	CWM	03/05/97	22.21	HORWITH TRUCKS, INC
NYB 8772813	97045	CWM	03/05/97	20.34	HORWITH TRUCKS, INC
NYB 8772795	97046	CWM	03/05/97	22.89	HORWITH TRUCKS, INC
NYB 8772804	97047	CWM	03/05/97	23.49	RANK'S VACUUM TRUCK SER
NYB 8773083	97048	CWM	03/06/97	22.81	RANK'S VACUUM TRUCK SER
NYB 8696673	97049	CWM	03/06/97	22.45	BUFFALO FUEL CORP.

TABLE 1. HAZARDOUS WASTE - OFF SITE SHIPMENTS					
STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT	COMPANY	DATE	IN TONS	TRANSPORTER
NYB 8772894	97050	CWM	03/06/97	22.93	BUFFALO FUEL CORP.
NYB 8772885	97051	CWM	03/06/97	22.31	BUFFALO FUEL CORP.
NYB 8772876	97052	CWM	03/06/97	22.16	HORWITH TRUCKS, INC
NYB 8772867	97053	CWM	03/06/97	24.12	HORWITH TRUCKS, INC
NYB 8696664	97054	CWM	03/06/97	23.86	HORWITH TRUCKS, INC
NYB 8696655	97055	CWM	03/06/97	22.78	HORWITH TRUCKS, INC
NYB 8772939	97056	CWM	03/07/97	23.38	HORWITH TRUCKS, INC
NYB 8772921	97057	CWM	03/07/97	23.96	HORWITH TRUCKS, INC
NYB 8772912	97058	CWM	03/07/97	22.84	HORWITH TRUCKS, INC
NYB 8772903	97059	CWM	03/07/97	23.82	HORWITH TRUCKS, INC
NYB 8696619	97060	CWM	03/07/97	21.93	HORWITH TRUCKS, INC
NYB 8696646	97061	CWM	03/07/97	22.76	HORWITH TRUCKS, INC
NYB 8773074	97062	CWM	03/07/97	22.32	HORWITH TRUCKS, INC
NYB 8773092	97063	CWM	03/07/97	23.66	RANK'S VACUUM TRUCK SER
NYB 8697573	97064	CWM	03/10/97	22.23	RANK'S VACUUM TRUCK SER
NYB 8697582	97065	CWM	03/10/97	23.60	BUFFALO FUEL CORP.
NYB 8696745	97066	CWM	03/10/97	21.55	BUFFALO FUEL CORP.
NYB 8696754	97067	CWM	03/10/97	23.00	HORWITH TRUCKS, INC
NYB 8696763	97068	CWM	03/10/97	23.81	HORWITH TRUCKS, INC
NYB 8696772	97069	CWM	03/10/97	22.98	HORWITH TRUCKS, INC
NYB 8696781	97070	CWM	03/10/97	24.73	HORWITH TRUCKS, INC
NYB 8696799	97071	CWM	03/10/97	23.81	HORWITH TRUCKS, INC
NYB 8696808	97072	CWM	03/10/97	23.31	HORWITH TRUCKS, INC
NYB 8696817	97073	CWM	03/10/97	22.73	HORWITH TRUCKS, INC
NYB 8772948	97074	CWM	03/10/97	24.77	HORWITH TRUCKS, INC
NYB 8696718	97075	CWM	03/10/97	22.13	HORWITH TRUCKS, INC
NYB 8696709	97076	CWM	03/10/97	22.13	HORWITH TRUCKS, INC
NYB 8696691	97077	CWM	03/10/97	22.81	BUFFALO FUEL CORP.
NYB 8696682	97078	CWM	03/10/97	22.90	BUFFALO FUEL CORP.
NYB 8697663	97080	CWM	03/11/97	24.23	BUFFALO FUEL CORP.
NYB 8697654	97081	CWM	03/11/97	25.68	BUFFALO FUEL CORP.
NYB 8697645	97082	CWM	03/11/97	23.78	BUFFALO FUEL CORP.
NYB 8697636	97083	CWM	03/11/97	22.43	HORWITH TRUCKS, INC
NYB 8697627	97084	CWM	03/11/97	24.42	HORWITH TRUCKS, INC
NYB 8697672	97085 *	CWM	03/11/97	24.08	HORWITH TRUCKS, INC
NYB 8697681	97086	CWM	03/11/97	23.70	HORWITH TRUCKS, INC
NYB 8697708	97087	CWM	03/11/97	24.53	HORWITH TRUCKS, INC
NYB 8697717	97088	CWM	03/11/97	24.36	HORWITH TRUCKS, INC
NYB 8697699	97089	CWM	03/11/97	21.33	HORWITH TRUCKS, INC
NYB 8773119	97090	CWM	03/11/97	22.74	HORWITH TRUCKS, INC
NYB 8773101	97091	CWM	03/11/97	23.18	HORWITH TRUCKS, INC
NYB 8696727	97092	CWM	03/11/97	23.18	HORWITH TRUCKS, INC
NYB 8697591	97093	CWM	03/11/97	24.45	BUFFALO FUEL CORP.



**TABLE 1. HAZARDOUS WASTE - OFF SITE SHIPMENTS**

STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT	COMPANY	DATE	IN TONS	TRANSPORTER
NYB 8696547	97094	CWM	03/12/97	22.11	BUFFALO FUEL CORP.
NYB 8696502	97095	CWM	03/12/97	23.68	BUFFALO FUEL CORP.
NYB 8696421	97096	CWM	03/12/97	24.72	BUFFALO FUEL CORP.
NYB 8696439	97097 *	CWM	03/12/97	26.16	BUFFALO FUEL CORP.
NYB 8696448	97098	CWM	03/12/97	23.73	HORWITH TRUCKS, INC
NYB 8696457	97099 *	CWM	03/12/97	24.58	HORWITH TRUCKS, INC
NYB 8696466	97100	CWM	03/12/97	23.53	HORWITH TRUCKS, INC
NYB 8696475	97101	CWM	03/12/97	23.30	HORWITH TRUCKS, INC
NYB 8696493	97102	CWM	03/12/97	23.18	HORWITH TRUCKS, INC
NYB 8696484	97103	CWM	03/12/97	23.07	HORWITH TRUCKS, INC
NYB 8696556	97104	CWM	03/12/97	23.54	HORWITH TRUCKS, INC
NYB 8696538	97105	CWM	03/12/97	22.86	HORWITH TRUCKS, INC
NYB 8696529	97106	CWM	03/12/97	23.23	HORWITH TRUCKS, INC
NYB 8696511	97107	CWM	03/12/97	22.96	BUFFALO FUEL CORP.
NYB 8696628	97108	CWM	03/12/97	22.06	BUFFALO FUEL CORP.
NYB 8696637	97109	CWM	03/12/97	21.92	BUFFALO FUEL CORP.
NYB 8696358	97110	CWM	03/13/97	26.54	BUFFALO FUEL CORP.
NYB 8696349	97111	CWM	03/13/97	24.62	RANK'S VACUUM TRUCK SER
NYB 8696331	97112	CWM	03/13/97	23.45	RANK'S VACUUM TRUCK SER
NYB 8696322	97113	CWM	03/13/97	24.18	HORWITH TRUCKS, INC
NYB 8696304	97114	CWM	03/13/97	23.58	HORWITH TRUCKS, INC
NYB 8696295	97115	CWM	03/13/97	24.53	HORWITH TRUCKS, INC
NYB 8696286	97116	CWM	03/13/97	24.26	HORWITH TRUCKS, INC
NYB 8696277	97117	CWM	03/13/97	22.73	HORWITH TRUCKS, INC
NYB 8696268	97118	CWM	03/13/97	23.61	HORWITH TRUCKS, INC
NYB 8696259	97119 *	CWM	03/13/97	23.15	HORWITH TRUCKS, INC
NYB 8696736	97120	CWM	03/13/97	24.91	HORWITH TRUCKS, INC
NYB 8697609	97121	CWM	03/13/97	23.75	HORWITH TRUCKS, INC
NYB 8697618	97122	CWM	03/13/97	25.52	HORWITH TRUCKS, INC
NYB 8696205	97123	CWM	03/13/97	22.21	BUFFALO FUEL CORP.
NYB 8696214	97124	CWM	03/13/97	21.26	BUFFALO FUEL CORP.
NYB 8696223	97125	CWM	03/13/97	21.29	BUFFALO FUEL CORP.
NYB 8697906	97126	CWM	03/14/97	24.58	BUFFALO FUEL CORP.
NYB 8697915	97127	CWM	03/14/97	23.67	BUFFALO FUEL CORP.
NYB 8697924	97128	CWM	03/14/97	23.21	BUFFALO FUEL CORP.
NYB 8697933	97129 *	CWM	03/14/97	25.01	HORWITH TRUCKS, INC
NYB 8697987	97130	CWM	03/14/97	23.50	HORWITH TRUCKS, INC
NYB 8697978	97131	CWM	03/14/97	22.85	HORWITH TRUCKS, INC
NYB 8697969	97132	CWM	03/14/97	23.96	HORWITH TRUCKS, INC
NYB 8697951	97133	CWM	03/14/97	22.38	HORWITH TRUCKS, INC
NYB 8697942	97134	CWM	03/14/97	22.55	HORWITH TRUCKS, INC
NYB 8696565	97135 *	CWM	03/14/97	24.24	HORWITH TRUCKS, INC
NYB 8696574	97136	CWM	03/14/97	21.81	HORWITH TRUCKS, INC

**TABLE 1. HAZARDOUS WASTE - OFF SITE SHIPMENTS**

STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT	COMPANY	DATE	IN TONS	TRANSPORTER
NYB 8698023	97138	CWM	03/14/97	23.60	HORWITH TRUCKS, INC
NYB 8698032	97139	CWM	03/14/97	22.17	BUFFALO FUEL CORP.
NYB 8697888	97140	CWM	03/14/97	21.86	BUFFALO FUEL CORP.
NYB 8697897	97141	CWM	03/14/97	22.43	BUFFALO FUEL CORP.
NYB 8697105	97142	CWM	03/17/97	25.12	BUFFALO FUEL CORP.
NYB 8697114	97143	CWM	03/17/97	24.56	RANK'S VACUUM TRUCK SER
NYB 8697123	97144 *	CWM	03/17/97	21.94	RANK'S VACUUM TRUCK SER
NYB 8697132	97145	CWM	03/17/97	24.34	HORWITH TRUCKS, INC
NYB 8697726	97146 *	CWM	03/17/97	24.35	HORWITH TRUCKS, INC
NYB 8697735	97147 *	CWM	03/17/97	24.69	HORWITH TRUCKS, INC
NYB 8697744	97148	CWM	03/17/97	23.97	HORWITH TRUCKS, INC
NYB 8697753	97149	CWM	03/17/97	21.84	HORWITH TRUCKS, INC
NYB 8697762	97150	CWM	03/17/97	23.70	HORWITH TRUCKS, INC
NYB 8697771	97151 *	CWM	03/17/97	24.62	HORWITH TRUCKS, INC
NYB 8696232	97152	CWM	03/17/97	23.10	HORWITH TRUCKS, INC
NYB 8696241	97153	CWM	03/17/97	22.32	HORWITH TRUCKS, INC
NYB 8697807	97154 *	CWM	03/17/97	23.84	HORWITH TRUCKS, INC
NYB 8697816	97155	CWM	03/17/97	23.86	HORWITH TRUCKS, INC
NYB 8697825	97156	CWM	03/17/97	23.94	HORWITH TRUCKS, INC
NYB 8697834	97157	CWM	03/17/97	23.24	HORWITH TRUCKS, INC
NYB 8697843	97158	CWM	03/17/97	23.24	HORWITH TRUCKS, INC
NYB 8697852	97159 *	CWM	03/17/97	25.11	HORWITH TRUCKS, INC
NYB 8697861	97160 *	CWM	03/17/97	22.64	BUFFALO FUEL CORP.
NYB 8697879	97161	CWM	03/18/97	23.88	BUFFALO FUEL CORP.
NYB 8696907	97162	CWM	03/18/97	24.49	BUFFALO FUEL CORP.
NYB 8696916	97163	CWM	03/18/97	22.34	BUFFALO FUEL CORP.
NYB 8696925	97164	CWM	03/18/97	24.45	BUFFALO FUEL CORP.
NYB 8696934	97165 *	CWM	03/18/97	24.59	HORWITH TRUCKS, INC
NYB 8696943	97166	CWM	03/18/97	23.43	HORWITH TRUCKS, INC
NYB 8696952	97167	CWM	03/18/97	24.85	HORWITH TRUCKS, INC
NYB 8696961	97168	CWM	03/18/97	24.78	HORWITH TRUCKS, INC
NYB 8696979	97169	CWM	03/18/97	21.85	HORWITH TRUCKS, INC
NYB 8696988	97170 *	CWM	03/18/97	24.69	HORWITH TRUCKS, INC
NYB 8696997	97171	CWM	03/18/97	22.88	HORWITH TRUCKS, INC
NYB 8697006	97172	CWM	03/18/97	23.37	HORWITH TRUCKS, INC
NYB 8697015	97173	CWM	03/18/97	22.68	HORWITH TRUCKS, INC
NYB 8697024	97174	CWM	03/18/97	23.28	HORWITH TRUCKS, INC
NYB 8698014	97175	CWM	03/18/97	23.78	HORWITH TRUCKS, INC
NYB 8697033	97176 *	CWM	03/18/97	24.15	HORWITH TRUCKS, INC
NYB 8697051	97177 *	CWM	03/18/97	25.08	HORWITH TRUCKS, INC
NYB 8698005	97178	CWM	03/18/97	23.80	BUFFALO FUEL CORP.
NYB 8697069	97179	CWM	03/18/97	22.30	BUFFALO FUEL CORP.
NYB 8697078	97180	CWM	03/18/97	23.69	BUFFALO FUEL CORP.

TABLE 1. HAZARDOUS WASTE - OFF SITE SHIPMENTS					
STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT	COMPANY	DATE	IN TONS	TRANSPORTER
NYB 8697996	97181	CWM	03/19/97	23.88	BUFFALO FUEL CORP.
NYB 8698041	97182	CWM	03/19/97	23.89	RANK'S VACUUM TRUCK SER
NYB 8698059	97183	CWM	03/19/97	26.00	RANK'S VACUUM TRUCK SER
NYB 8696367	97184	CWM	03/19/97	22.89	HORWITH TRUCKS, INC
NYB 8696376	97185	CWM	03/19/97	24.32	HORWITH TRUCKS, INC
NYB 8696385	97186	CWM	03/19/97	22.71	HORWITH TRUCKS, INC
NYB 8696394	97187	CWM	03/19/97	25.46	HORWITH TRUCKS, INC
NYB 8696826	97188 *	CWM	03/19/97	25.41	HORWITH TRUCKS, INC
NYB 8696835	97189 *	CWM	03/19/97	24.02	HORWITH TRUCKS, INC
NYB 8696844	97190	CWM	03/19/97	23.31	HORWITH TRUCKS, INC
NYB 8696853	97191 *	CWM	03/19/97	24.04	HORWITH TRUCKS, INC
NYB 8696862	97192	CWM	03/19/97	23.01	HORWITH TRUCKS, INC
NYB 8696871	97193 *	CWM	03/19/97	26.00	HORWITH TRUCKS, INC
NYB 8697087	97196 *	CWM	03/19/97	24.30	HORWITH TRUCKS, INC
NYB 8697096	97197	CWM	03/19/97	23.55	HORWITH TRUCKS, INC
NYB 8696583	97198	CWM	03/19/97	23.70	HORWITH TRUCKS, INC
NYB 8696592	97199	CWM	03/19/97	21.39	BUFFALO FUEL CORP.
NYB 8696898	97194	CWM	03/20/97	23.18	BUFFALO FUEL CORP.
NYB 8696403	97195 *	CWM	03/20/97	23.80	BUFFALO FUEL CORP.
NYB 8696601	97200	CWM	03/20/97	21.97	BUFFALO FUEL CORP.
NYB 8697195	97201	CWM	03/20/97	24.45	HORWITH TRUCKS, INC
NYB 8697204	97202	CWM	03/20/97	22.28	HORWITH TRUCKS, INC
NYB 8697213	97203 *	CWM	03/20/97	24.74	BUFFALO FUEL CORP.
NYB 8660592	97204	CWM	03/20/97	22.45	HORWITH TRUCKS, INC
NYB 8660601	97205	CWM	03/20/97	25.95	HORWITH TRUCKS, INC
NYB 8660583	97206 *	CWM	03/20/97	25.72	HORWITH TRUCKS, INC
NYB 8660574	97207	CWM	03/20/97	26.10	HORWITH TRUCKS, INC
NYB 8660565	97208	CWM	03/20/97	22.43	HORWITH TRUCKS, INC
NYB 8660556	97209	CWM	03/20/97	23.17	HORWITH TRUCKS, INC
NYB 8660547	97210 *	CWM	03/20/97	24.85	HORWITH TRUCKS, INC
NYB 8660538	97211 *	CWM	03/20/97	23.07	HORWITH TRUCKS, INC
NYB 8697186	97214	CWM	03/20/97	23.44	HORWITH TRUCKS, INC
NYB 8697141	97215 *	CWM	03/20/97	25.22	HORWITH TRUCKS, INC
NYB 8697159	97216	CWM	03/20/97	22.49	HORWITH TRUCKS, INC
NYB 8697168	97217 *	CWM	03/20/97	22.32	BUFFALO FUEL CORP.
NYB 8697177	97218	CWM	03/20/97	25.01	BUFFALO FUEL CORP.
NYB 8698068	97219	CWM	03/20/97	22.85	BUFFALO FUEL CORP.
NYB 8696196	97220 *	CWM	03/20/97	22.73	BUFFALO FUEL CORP.
NYB 8660529	97212	CWM	03/21/97	24.66	BUFFALO FUEL CORP.
NYB 8660511	97213	CWM	03/21/97	23.17	RANK'S VACUUM TRUCK SER
NYB 8660619	97221	CWM	03/21/97	24.13	RANK'S VACUUM TRUCK SER

TABLE 1. HAZARDOUS WASTE - OFF SITE SHIPMENTS					
STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT	COMPANY	DATE	IN TONS	TRANSPORTER
NYB 8660628	97222	CWM	03/21/97	25.13	HORWITH TRUCKS, INC
NYB 8660637	97223	CWM	03/21/97	23.71	HORWITH TRUCKS, INC
NYB 8660727	97224	CWM	03/21/97	22.50	HORWITH TRUCKS, INC
NYB 8660646	97225 *	CWM	03/21/97	27.73	HORWITH TRUCKS, INC
NYB 8660655	97226	CWM	03/21/97	27.46	HORWITH TRUCKS, INC
NYB 8660664	97227	CWM	03/21/97	26.72	HORWITH TRUCKS, INC
NYB 8660673	97228	CWM	03/21/97	25.01	HORWITH TRUCKS, INC
NYB 8660763	97231	CWM	03/21/97	23.56	HORWITH TRUCKS, INC
NYB 8660772	97232 *	CWM	03/21/97	22.29	HORWITH TRUCKS, INC
NYB 8660781	97233	CWM	03/21/97	23.81	HORWITH TRUCKS, INC
NYB 8660799	97234	CWM	03/21/97	22.94	BUFFALO FUEL CORP.
NYB 8660808	97235	CWM	03/21/97	22.99	BUFFALO FUEL CORP.
NYB 8660709	97236 *	CWM	03/21/97	24.42	BUFFALO FUEL CORP.
NYB 8660718	97237	CWM	03/21/97	22.75	BUFFALO FUEL CORP.
NYB 8660736	97238	CWM	03/21/97	25.04	BUFFALO FUEL CORP.
NYB 8660745	97239	CWM	03/21/97	24.11	PAGE ENV. TRANSPORT CO.
NYB 8660754	97240	CWM	03/21/97	23.58	PAGE ENV. TRANSPORT CO.
NYB 8660682	97229	CWM	03/24/97	21.18	PAGE ENV. TRANSPORT CO.
NYB 8660691	97230	CWM	03/24/97	22.57	PAGE ENV. TRANSPORT CO.
NYB 8660349	97241	CWM	03/24/97	25.24	PAGE ENV. TRANSPORT CO.
NYB 8660457	97242	CWM	03/24/97	21.87	HORWITH TRUCKS, INC
NYB 8660367	97243	CWM	03/24/97	23.31	HORWITH TRUCKS, INC
NYB 8660376	97244	CWM	03/24/97	22.84	HORWITH TRUCKS, INC
NYB 8660385	97245	CWM	03/24/97	25.62	HORWITH TRUCKS, INC
NYB 8660466	97246	CWM	03/24/97	22.84	HORWITH TRUCKS, INC
NYB 8660475	97247	CWM	03/24/97	24.29	HORWITH TRUCKS, INC
NYB 8660412	97248	CWM	03/24/97	25.37	HORWITH TRUCKS, INC
NYB 8660439	97250	CWM	03/24/97	22.19	PAGE ENV. TRANSPORT CO.
NYB 8660331	97252 *	CWM	03/24/97	25.65	PAGE ENV. TRANSPORT CO.
NYB 8660322	97253	CWM	03/24/97	25.06	HORWITH TRUCKS, INC
NYB 8660313	97254	CWM	03/24/97	23.99	HORWITH TRUCKS, INC
NYB 8660304	97255	CWM	03/24/97	21.60	BUFFALO FUEL CORP.
NYB 8660295	97256	CWM	03/24/97	23.09	BUFFALO FUEL CORP.
NYB 8660277	97257	CWM	03/24/97	21.45	BUFFALO FUEL CORP.
NYB 8660286	97258	CWM	03/24/97	21.42	BUFFALO FUEL CORP.
NYB 8660421	97249	CWM	03/25/97	23.36	BUFFALO FUEL CORP.
NYB 8660448	97251	CWM	03/25/97	23.93	RANK'S VACUUM TRUCK SER
NYB 8660241	97259	CWM	03/25/97	26.17	RANK'S VACUUM TRUCK SER
NYB 8660232	97260	CWM	03/25/97	25.66	HORWITH TRUCKS, INC
NYB 8660223	97261	CWM	03/25/97	23.42	HORWITH TRUCKS, INC
NYB 8660214	97262 *	CWM	03/25/97	26.65	HORWITH TRUCKS, INC

**TABLE 1. HAZARDOUS WASTE - OFF SITE SHIPMENTS**

STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT	COMPANY	DATE	IN TONS	TRANSPORTER
NYB 8660205	97263	CWM	03/25/97	25.10	HORWITH TRUCKS, INC
NYB 8660196	97264	CWM	03/25/97	22.14	HORWITH TRUCKS, INC
NYB 8660178	97265	CWM	03/25/97	21.43	HORWITH TRUCKS, INC
NYB 8660187	97266	CWM	03/25/97	22.80	HORWITH TRUCKS, INC
NYB 8660169	97267	CWM	03/25/97	22.11	HORWITH TRUCKS, INC
NYB 8660151	97268	CWM	03/25/97	23.73	HORWITH TRUCKS, INC
NYB 8183772	97272	CWM	03/25/97	24.16	HORWITH TRUCKS, INC
NYB 8183781	97273	CWM	03/25/97	24.24	HORWITH TRUCKS, INC
NYB 8183799	97274	CWM	03/25/97	21.85	HORWITH TRUCKS, INC
NYB 8183808	97275	CWM	03/25/97	24.39	BUFFALO FUEL CORP.
NYB 8183817	97276	CWM	03/25/97	22.79	BUFFALO FUEL CORP.
NYB 8660142	97269	CWM	03/26/97	22.60	BUFFALO FUEL CORP.
NYB 8660133	97270	CWM	03/26/97	23.63	BUFFALO FUEL CORP.
NYB 8660124	97271	CWM	03/26/97	22.60	BUFFALO FUEL CORP.
NYB 8183763	97277	CWM	03/26/97	24.68	HORWITH TRUCKS, INC
NYB 8660259	97278	CWM	03/26/97	23.40	HORWITH TRUCKS, INC
NYB 8660484	97279	CWM	03/26/97	23.83	HORWITH TRUCKS, INC
NYB 8660493	97280	CWM	03/26/97	24.30	HORWITH TRUCKS, INC
NYB 8660502	97281 *	CWM	03/26/97	24.46	HORWITH TRUCKS, INC
NYB 8660106	97282	CWM	03/26/97	21.70	HORWITH TRUCKS, INC
NYB 8660115	97283	CWM	03/26/97	22.27	HORWITH TRUCKS, INC
PAE 7249491	97284	Envirite	7/31/97	21.31	FREEHOLD CARTAGE, INC.
PAE 7249480	97285	Envirite	7/31/97	23.89	FREEHOLD CARTAGE, INC.
PAE 7249476	97286	Envirite	8/1/97	24.30	FREEHOLD CARTAGE, INC.
PAE 7249406	97287	Envirite	8/1/97	24.39	FREEHOLD CARTAGE, INC.
PAE 4964002	97288	Envirite	8/1/97	23.56	FREEHOLD CARTAGE, INC.
PAE 7249465	97289	Envirite	8/4/97	23.92	FREEHOLD CARTAGE, INC.
PAE 6745583	97290	Envirite	8/4/97	23.44	FREEHOLD CARTAGE, INC.
PAE 7236854	97291	Envirite	8/4/97	22.34	FREEHOLD CARTAGE, INC.
PAE 7249502	97292	Envirite	8/4/97	24.05	FREEHOLD CARTAGE, INC.
PAE 4963884	97293	Envirite	8/4/97	23.03	FREEHOLD CARTAGE, INC.
PAE 4963895	97294	Envirite	8/5/97	23.43	FREEHOLD CARTAGE, INC.
PAE 4963906	97295	Envirite	8/5/97	24.36	FREEHOLD CARTAGE, INC.
PAE 4963910	97296	Envirite	8/5/97	23.99	FREEHOLD CARTAGE, INC.
PAE 4963921	97297	Envirite	8/5/97	24.06	FREEHOLD CARTAGE, INC.
PAE 4963932	97298	Envirite	8/5/97	22.37	FREEHOLD CARTAGE, INC.
PAE 4963943	97299	Envirite	8/12/97	24.48	FREEHOLD CARTAGE, INC.
PAE 4963954	97300	Envirite	8/12/97	24.77	FREEHOLD CARTAGE, INC.
PAE 4963965	97301	Envirite	8/12/97	23.20	FREEHOLD CARTAGE, INC.
PAE 7230263	97302	Envirite	8/13/97	24.09	FREEHOLD CARTAGE, INC.
PAE 7230274	97303	Envirite	8/13/97	23.26	FREEHOLD CARTAGE, INC.

**TABLE 1. HAZARDOUS WASTE - OFF SITE SHIPMENTS**

STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT	COMPANY	DATE	IN TONS	TRANSPORTER
PAE 7230285	97304	Envirite	8/13/97	23.52	FREEHOLD CARTAGE, INC.
PAE 7230296	97305	Envirite	8/21/97	24.55	FREEHOLD CARTAGE, INC.
PAE 7230300	97306	Envirite	8/21/97	23.24	FREEHOLD CARTAGE, INC.
PAE 7230311	97307	Envirite	8/21/97	22.13	FREEHOLD CARTAGE, INC.
PAE 7230322	97308	Envirite	8/22/97	23.41	FREEHOLD CARTAGE, INC.
PAE 7230333	97309	Envirite	8/22/97	24.67	FREEHOLD CARTAGE, INC.
PAE 7230344	97310	Envirite	8/29/97	23.12	FREEHOLD CARTAGE, INC.
PAE 7230355	97311	Envirite	8/29/97	24.83	FREEHOLD CARTAGE, INC.
PAE 7230366	97312	Envirite	8/29/97	24.09	JOHN PFROMMER, INC.
PAE 7230370	97313	Envirite	8/29/97	23.62	JOHN PFROMMER, INC.
PAE 7230381	97314	Envirite	8/29/97	24.18	JOHN PFROMMER, INC.
PAE 7230392	97315	Envirite	9/2/97	25.63	FREEHOLD CARTAGE, INC.
PAE 7230403	97316	Envirite	9/2/97	24.89	FREEHOLD CARTAGE, INC.
PAE 7230414	97317	Envirite	9/2/97	24.41	JOHN PFROMMER, INC.
PAE 7230425	97318	Envirite	9/2/97	24.02	JOHN PFROMMER, INC.
PAE 7230436	97319	Envirite	9/2/97	23.70	JOHN PFROMMER, INC.
PAE 7230440	97320	Envirite	9/8/97	23.12	JOHN PFROMMER, INC.
PAE 7230451	97321	Envirite	9/8/97	23.93	JOHN PFROMMER, INC.
PAE 7230462	97322	Envirite	9/8/97	24.77	JOHN PFROMMER, INC.
PAE 7230473	97323	Envirite	9/8/97	23.54	FREEHOLD CARTAGE, INC.
PAE 7230484	97324	Envirite	9/8/97	21.77	FREEHOLD CARTAGE, INC.
PAE 8291452	97325	Envirite	9/11/97	23.69	FREEHOLD CARTAGE, INC.
PAE 8291463	97326	Envirite	9/11/97	24.00	FREEHOLD CARTAGE, INC.
PAE 8291474	97327	Envirite	9/12/97	23.48	JOHN PFROMMER, INC.
PAE 8291485	97328	Envirite	9/12/97	22.41	JOHN PFROMMER, INC.
PAE 8291496	97329	Envirite	9/12/97	25.76	JOHN PFROMMER, INC.
PAE 8291500	97330	Envirite	9/19/97	23.93	FREEHOLD CARTAGE, INC.
PAE 8291511	97331	Envirite	9/19/97	21.87	FREEHOLD CARTAGE, INC.
PAE 8291533	97332	Envirite	9/19/97	23.30	JOHN PFROMMER, INC.
PAE 8291544	97333	Envirite	9/19/97	23.71	JOHN PFROMMER, INC.
PAE 8291555	97334	Envirite	9/19/97	22.88	JOHN PFROMMER, INC.
PAE 8291566	97335	Envirite	9/22/97	23.90	JOHN PFROMMER, INC.
PAE 8291570	97336	Envirite	9/22/97	21.89	JOHN PFROMMER, INC.
PAE8291592	98003	Envirite	3/5/98	24.13	FREEHOLD CARTAGE, INC.
PAE8291603	98004	Envirite	3/6/98	23.01	FREEHOLD CARTAGE, INC.
PAE8291625	98005	Envirite	3/9/98	22.55	FREEHOLD CARTAGE, INC.
PAE8291636	98006	Envirite	3/11/98	24.12	FREEHOLD CARTAGE, INC.
PAE8291640	98008	Envirite	3/12/98	22.17	FREEHOLD CARTAGE, INC.
PAE8291651	98009	Envirite	3/13/98	23.01	FREEHOLD CARTAGE, INC.
PAE8291662	98010	Envirite	3/13/98	22.23	FREEHOLD CARTAGE, INC.
PAE8291673	98011	Envirite	3/16/98	22.29	FREEHOLD CARTAGE, INC.

TABLE 1. HAZARDOUS WASTE - OFF SITE SHIPMENTS					
STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT #	COMPANY	DATE	IN TONS	TRANSPORTER
PAE8291684	98012	Envirite	3/16/98	23.75	FREEHOLD CARTAGE, INC.
PAE8291695	98013	Envirite	3/17/98	25.83	FREEHOLD CARTAGE, INC.
PAE8291706	98014	Envirite	3/17/98	22.60	FREEHOLD CARTAGE, INC.
PAE8291415	98015	Envirite	3/18/98	23.20	FREEHOLD CARTAGE, INC.
PAE8291441	98016	Envirite	3/18/98	22.25	FREEHOLD CARTAGE, INC.
PAE8294554	98017	Envirite	03/19/98	22.58	FREEHOLD CARTAGE, INC.
PAE8294543	98018	Envirite	03/19/98	22.34	FREEHOLD CARTAGE, INC.
PAE8294565	98019	Envirite	3/20/98	23.75	FREEHOLD CARTAGE, INC.
PAE8294580	98020	Envirite	3/20/98	23.37	FREEHOLD CARTAGE, INC.
PAE8899376	98021	Envirite	3/23/98	23.63	FREEHOLD CARTAGE, INC.
PAE8899380	98022	Envirite	3/23/98	22.71	FREEHOLD CARTAGE, INC.
PAE8899391	98023	Envirite	3/24/98	25.42	FREEHOLD CARTAGE, INC.
PAE8899402	98024	Envirite	3/24/98	21.92	FREEHOLD CARTAGE, INC.
PAE8899413	98025	Envirite	3/25/98	23.77	FREEHOLD CARTAGE, INC.
PAE8899424	98026	Envirite	3/25/98	22.01	FREEHOLD CARTAGE, INC.
PAE8899435	98027	Envirite	3/26/98	25.05	FREEHOLD CARTAGE, INC.
PAE8899446	98028	Envirite	3/26/98	23.37	FREEHOLD CARTAGE, INC.
PAE8899450	98029	Envirite	3/27/98	23.38	FREEHOLD CARTAGE, INC.
PAE8899461	98030	Envirite	3/27/98	23.34	FREEHOLD CARTAGE, INC.
PAE8899472	98031	Envirite	3/30/98	24.29	FREEHOLD CARTAGE, INC.
PAE8899483	98032	Envirite	3/30/98	21.96	FREEHOLD CARTAGE, INC.
PAE8899494	98033	Envirite	3/30/98	21.95	FREEHOLD CARTAGE, INC.
PAE8899505	98034	Envirite	3/30/98	22.83	FREEHOLD CARTAGE, INC.
PAE8899516	98035	Envirite	3/30/98	22.62	FREEHOLD CARTAGE, INC.
PAE8899520	98036	Envirite	3/31/98	23.33	FREEHOLD CARTAGE, INC.
PAE8899531	98037	Envirite	3/31/98	24.64	FREEHOLD CARTAGE, INC.
PAE8899542	98038	Envirite	3/31/98	22.21	FREEHOLD CARTAGE, INC.
PAE8899553	98039	Envirite	3/31/98	23.21	FREEHOLD CARTAGE, INC.
PAE8899564	98040	Envirite	3/31/98	22.78	FREEHOLD CARTAGE, INC.
PAE8899575	98041	Envirite	4/1/98	24.11	FREEHOLD CARTAGE, INC.
PAE8899586	98042	Envirite	4/1/98	23.60	FREEHOLD CARTAGE, INC.
	Total tons shipped			8,577	
ASPHALTIC MATERIAL SHIPMENTS - F001					
STATE	GENERATOR	TSD		WASTE	
MANIFEST	MANIFEST	FACILITY	SHIPPED	SHIPPED	
DOCUMENT #	DOCUMENT #	COMPANY	DATE	IN TONS	TRANSPORTER
NJA2727361	27361	Clean	02/18/98	0.10	Clean Harbors Environmental
		Harbors Environmental			
MDC0797087	98253	Safety Klee	09/11/98	0.10	Safety Kleen (TS), Inc.

TABLE 2. RECYCLED



**TABLE 2 - RECYCLED MATERIAL - SHIPPED OFF SITE**

Company	Recycled Material	Date Shipped	No. of Loads	Total Cu. Yds.
J.N.Mannis	concrete	03/25/97	18	90
J.N. Mannis	concrete	03/26/97	18	90
B.J. Recycle	wood	01/22/97	1	5
B.J. Recycle	concrete	01/22/97	1	5
B.J. Recycle	concrete	01/29/97	1	5
B.J. Recycle	stumps	01/29/97	1	6
B.J. Recycle	stumps	02/03/97	1	5
B.J. Recycle	concrete	02/03/97	1	5
B.J. Recycle	concrete	02/11/97	6	30
B.J. Recycle	concrete	02/14/97	2	10
B.J. Recycle	concrete	02/17/97	1	5
B.J. Recycle	concrete	02/18/97	1	5
B.J. Recycle	mixed	09/11/97	6	30
B.J. Recycle	mixed	09/12/97	3	15
B.J. Recycle	mixed	09/15/97	3	15
B.J. Recycle	mixed	09/16/97	1	5
B.J. Recycle	mixed	09/17/97	4	20
B.J. Recycle	mixed	09/19/97	1	5
B.J. Recycle	mixed	11/07/97	2	10
B.J. Recycle	stumps	11/07/97	1	5
B.J. Recycle	stumps	01/16/98	2	10
		<b>TOTALS</b>	<b>75</b>	<b>376</b>

**TABLE 3: TEST  
RESULTS**

### Table 3 - Post Excavation Soil Results

GRID SAMPLE RECAP			AcuTest	In-house	Value used
	AccuTest		Result	Result	to Average
Sample Point	Job Number	Grid Point	mg/Kg	mg/Kg	mg/Kg
1	E24454-1	X8	<10	<10	5
2		A8		13	13
3	E24454-2	B8	16	15	16
4	E24454-3	D7	15	16	15
5		C7		<10	3
6		B7		<10	3
7		A7		<10	3
8	E24454-7	X7	<10	<10	5
9	E24454-7	X6	47	44	47
10	E39051-6	A6	18	<10	18
11	E35296-2	B6	15	106	15
12	E35296-1	C6	18	<10	18
13	E24454-7	D6	20	17	20
14		C5		<10	5
15		B5		<10	5
16	E39051-5	A5	69	<10	69
17	E24454-7	X5	255	263	255
18	E24454-8	X4	102	103	102
19	E39051-4/E	A4	25	<10	25
20		AB4	306	50	306
21	E27352-1	B4	<11	107	6
22	E27352-2	BC4	87	11	87
23	E24454-9	C4	<10	<10	5
24	E24454-10	C3	10	11	10
25	E27352-3	BC3	38	38	38
26	E27352-4	B3	241	174	241
27	E27352-5	AB3	79	41	79
28	E39051-3	A3	24	<10	24
29	E24454-11	X3	<10	<10	5
30	E24454-12	X2	145	143	145
31	E39051-2	A2	<11	<10	6
32		AB2			
33	E27352-6	B2	291	106	291
34	E24454-13	BC2	<11	<10	6
35	E24454-14	C2	<10	<10	5
36		B1		<10	5
37		AB1		<10	5
38	E39051-1	A1	<10	<10	5
39		X1		<10	5
40	E23703-1	P1	41		41
41	E23703-2	P2	<11		6
42	E23703-3	P3	<12		6
43		P4			
					mg/Kg
				Average	10
				Maximum	306
				Count	41

TABLE 4 & 5:  
FINAL RESULTS

<b>TABLE 4 - Certified Laboratory Results</b>					
<b>Sample number</b>	<b>AccuTest Sample #</b>	<b>mg/Kg (ppm)</b>		<b>Date Collected</b>	<b>Source Pile Number</b>
		<b>Accutest Results</b>	<b>In-house Field Test</b>		
121BLD1117		204	322	11/17/97	Pile Sample
122BLD1117		198	210	11/17/97	Pile 23
123AGRD1118		306	275	11/18/97	Point AB4
124AGRD1118		31	24	11/18/97	Point B4
125AGRD1118		95.7	72	11/18/97	Point BC4
128BLD1118		368	281	11/18/97	Pile 29b
129BLD1119		226	209	11/19/97	Pile 30b-1
130AGRD1120		79.6	70	11/20/97	Point AB3
131AGRD1120		241	393	11/20/97	Point B3
132AGRD1120		297	276	11/20/97	Point BC3
133BLD1124		460	404	11/24/97	Pile 35b
144BLD121		377	335	12/01/97	Pile 40b-1
146BLD123		230	209	12/03/97	Pile 40b-2
147BLD124		419/	285	12/04/97	Pile Sample
148BLD125		126	240	12/05/97	Pile 39b
149BLD126		363	345	12/06/97	Pile 36b-2
150BLD126		160	127	12/06/97	Pile 43b
151RAW129		51.4	63	12/09/97	Pile 44
152BLD1211		330	271	12/11/97	Pile 36b-1
153BLD1216		293	337	12/16/97	Pile 38b
155AGRD1216		325	560	12/16/97	Point AB2A
156AGRD1216		548	427	12/16/97	Point AB2B
157AGRD1216		53.1	39	12/16/97	Point B2
158-162GRD1217		80.8	60	12/17/97	Sump 2 area
163GRD1217		429	447	12/17/97	Sump 2 area
164GRD1218		273	366	12/18/97	Sump 1 area
165BLD1219		136	110	12/19/97	Pile 35b
166BLD1224		316	260	12/24/97	Pile 6b-1
167BLD1231		222	286	12/31/97	Pile 6b-2
168BLD16		252	228	01/06/98	Pile 6b-3
175BLD19		269	287	01/09/98	Pile 30b-2
176BLD19		470	383	01/09/98	Pile 30b-2
177RAW112		40.7	18	01/12/98	Pipeline area
180BLD115		259	686/462/229	01/15/97	Pile 30b-4
181BLD116		217	221	01/16/98	Pile 30b-4/30b-3
182RAW119		168	147	01/19/98	Sump area rear
184BLD120		547	613/401	01/20/98	Pile 45b-1
185BLD120		429	415	01/20/98	Pile 45b-2
186BLD121		569	314	01/21/98	Pile 30b-2
188BLD122		400	323	01/22/98	Pile 30b-6
189BLD127		165	210	01/27/98	Pile 46b-1
190,191,193BLD		302	272	1/27-1/29/9	Pile 46b-1 (com
196BLD130		223	217	01/30/98	Pile Sample
197RAW130		362	379	01/30/98	Pile Sample
199BLD23		452	334	02/03/98	Pile Sample

**TABLE 4 - Certified Laboratory Results**

Sample number	AccuTest Sample #	mg/Kg (ppm)		Date Collected	Source Pile Number
		Accutest Results	In-house Field Test		
201BLD24		337	387	02/04/98	Pile 45b-2
203BLD26		290	243	02/06/98	Pile 53&50
204BLD26		231	259	02/06/98	Pile 45b-1 & 30b
205BLD210		336	395	02/10/98	Pile 30b-2a
206BLD211		358	360	02/11/98	Pile 30b-2b
207BLD211		335	386	02/11/98	Pile 30b-2c
208BLD212		239	226	02/12/98	Pile 30b-2d
209BLD212		241	226	02/12/98	Pile 30b-2e
211RAW216		168	134	02/16/98	Subroad (lot to e
214BLD223		338	324	02/23/98	Pile 55b-1
215RAW32		138	109	03/02/98	N/W cmr of stor
217BLD32		402	379	03/02/98	Pile 55b-2
220BLD311		161	169	03/11/98	Pile 55b-2a
221BLD311		376	275	03/11/98	Pile 55b-2b
224BLD312		365	348	03/12/98	Pile 54b
226BLD313		438	327	03/13/98	pile 56b-1
235BLD317		310	320	03/17/98	Pile 56b-2
237BLD326		315	271	03/26/98	Piles 55b-4 & 58
238BLD326		431	372	03/26/98	Piles 55b-4 & 58
242BLD328		365	329	03/28/98	Pile 55b-6
243BLD328		278	301	03/28/98	Pile 55b-5a
244BLD328		259	279	03/28/98	Pile 55b-8
245BLD330		344	338	03/30/98	Pile 55b-5b
246BLD330		350	314	03/30/98	Pile 55b-9
248BLD331		306	268	03/31/98	Pile 55b-11
249BLD331		272	222	03/31/98	Pile 55b-10
250BLD41		238	195	04/01/98	Pile 55b-12
251BLD41		272	256	04/01/98	Pile 55b-7a
252BLD42		225	265	04/02/98	Pile 55b-7b
254BLD43		325	245	04/03/98	Pile 55b-13
255BLD43		360	384	04/03/98	Pile 55b-14
256BLD46		256	225	04/06/98	Pile 55b-15
258BLD47		886	325	04/07/98	Pile 58b-3
260BLD47		313	309	04/07/98	Pile 58b-1
261BLD48		308	363	04/08/98	Pile 58b-2
262BLD48		468	440	04/08/98	Pile 58b-4
264BLD413		336	311	04/13/98	Pile 58b-3 resa
265BLD413		335	303	04/13/98	Pile 58b-4 resa
266BLD413		182	208	04/13/98	Pile 55b-4b resa
267BLD414		202	203	04/14/98	Area 6 decon
268BLD415		168	259	04/15/98	Pile 51b-1
269BLD416		164	220	04/16/98	Pile 51b-2
271BLD420		276	236	04/20/98	Pile 51b-3

<b>TABLE 4 - Certified Laboratory Results</b>					
<b>Sample number</b>	<b>AccuTest Sample #</b>	<b>mg/Kg (ppm)</b>		<b>Date Collected</b>	<b>Source Pile Number</b>
		<b>Accutest Results</b>	<b>In-house Field Test</b>		
272BLD421		408	373	04/21/98	Pile 51b-4
276BLD429		298	321	04/29/98	Pile 51b-4 resa
GRID C-6	E35296-1	18			GRID SAMPLE
GRID B-6	E35296-2	15			GRID SAMPLE
GRID A-4	E35296-3	14			GRID SAMPLE
278GRD617	E35964-1	358	260	06/17/98	GRID SAMPLE
PILE 76	E36677-1	272	235	07/06/98	PILE SAMPLE
282SRC76	E36677-2	422	317	07/06/98	PILE SAMPLE
283SRC76	E36677-3	446	363	07/06/98	PILE SAMPLE
285BLD710	E36884-1	322	295	07/09/98	PILE SAMPLE
286BLD79	E36799-1	236	285	07/09/98	PILE SAMPLE
288REW714	E37046-1	361	328	07/14/98	PILE SAMPLE
289REW714	E37046-2	159	153	07/14/98	PILE SAMPLE
290BLD715	E37046-3	165		07/16/98	PILE SAMPLE
291BLD715	E37046-4	291		07/16/98	PILE SAMPLE
293BLD716	E37046-5	151	119	07/16/98	PILE SAMPLE
297BLD720	E37156-1	156	146	07/20/98	PILE SAMPLE
298BLD720	E37156-2	128	123	07/20/98	PILE SAMPLE
299BLD721	E37192-1	266	256	07/21/98	PILE SAMPLE
300BLD721	E37192-2	299	198	07/21/98	PILE SAMPLE
301BLD721	E37192-3R	348	328	07/21/98	PILE SAMPLE
303CLR722	E37304-1	134	224	07/22/98	Near side of ber
304BLD722	E37304-2	328	287	07/22/98	PILE SAMPLE
305BLD722	E37304-3	472	370	07/22/98	PILE SAMPLE
306BLD723	E37395-1	296	362	07/23/98	PILE SAMPLE
307BLD723	E37395-2	383	276	07/23/98	PILE SAMPLE
308BLD724	E37395-3	306	275	07/24/98	PILE SAMPLE
309REW727	E37433-1	332	337	07/27/98	PILE SAMPLE
310BLD727	E37433-2	292	241	07/27/98	PILE SAMPLE
311BLD728	E37433-3	242	218	07/28/98	PILE SAMPLE
313BLD729	E37532-1	363	301	07/28/98	PILE SAMPLE
314BLD729	E37748-1	159	557	07/29/98	PILE SAMPLE
315BLD83	E37748-2	238	256	08/03/98	PILE SAMPLE
316BLD84	E37748-3	415	302	08/03/98	PILE SAMPLE
317BLD85	E37858-1	301	223	08/05/98	PILE SAMPLE
318BLD85	E37858-2	519	337	08/05/98	PILE SAMPLE
319BLD86	E37858-3	247	267	08/06/98	PILE SAMPLE
321BLD87	E37977-1	252	226	08/07/98	PILE SAMPLE
322BLD87	E37977-2/R/2	373	210	08/07/98	PILE SAMPLE
325REW88	E37977-3	226	240	08/08/98	PILE SAMPLE
326BLD810	E38016-4	238	293	08/10/98	PILE SAMPLE
328BLD810	E38016-5	187	206	08/10/98	PILE SAMPLE
329REW811	E38016-1	147	154	08/11/98	PILE SAMPLE
330REW811	E38016-2	222	203	08/11/98	PILE SAMPLE
331REW811	E38016-3	164	120	08/11/98	PILE SAMPLE

<b>TABLE 4 - Certified Laboratory Results</b>					
<b>Sample number</b>	<b>AccuTest Sample #</b>	<b>mg/Kg (ppm)</b>		<b>Date Collected</b>	<b>Source Pile Number</b>
		<b>Accutest Results</b>	<b>In-house Field Test</b>		
333BLD812	E38181-1	176	148	08/12/98	PILE SAMPLE
335BLD813	E38181-2	348	308	08/13/98	PILE SAMPLE
336REW813	E38181-3	332	268	08/13/98	PILE SAMPLE
337BLD813	E38315-1	445	328	08/13/98	PILE SAMPLE
338BLD813	E38315-2	208	190	08/13/98	PILE SAMPLE
339REW814	E38315-3	240	195	08/14/98	PILE SAMPLE
350BLD817	E38315-4	321	349	08/17/98	Pile 59-2, Appro
351BLD817	E38627-6	121	109	08/17/98	Pile 59-2, Appro
352BLD818	E38413-1	229	189	08/18/98	
355BLD820	E38465-1	326	324	08/20/98	From 354PRB8
358REW821	E38465-2	291	203	08/21/98	From 337BLD81
359REW821	E38465-3	264	336	08/21/98	From 357BLD82
365REW824	E38549-1	346	307	08/24/98	From 356PRB8
366REW825	E38627-1	292	288	08/25/98	From 356PRB8
367REW825	E38627-2	236	201	08/25/98	PILE SAMPLE
368REW825	E38627-3	234	205	08/25/98	From 362BLD82
369REW825	E38627-4	247	224	08/25/98	From 356PRB8
370REW825	E38627-5	416	312	08/25/98	From 364PRB8
371BLD827	E38723-1	384	313	08/27/98	PILE SAMPLE
372BLD827	E38723-2	336	342	08/27/98	PILE SAMPLE
374REW92	E38924-4	380	278	09/02/98	From 370REW8
378REW94	E39050-1	305	290	09/04/98	From 376BLD92
379REW94	E39050-2	357	243	09/04/98	From 376BLD92
A1 #1 827	E39051-1	<10	30	08/27/98	Grid sample fro
A2 #1 827	E39051-2	<11	ND	08/27/98	Grid sample fro
A3 #1 827	E39051-3	37.2	ND	08/27/98	Grid sample fro
A4 #1 827	E39051-4	24	23	08/27/98	Grid sample fro
A5 #1 827	E39051-5	69	80	08/27/98	Grid sample fro
A6 #1 827	E39051-6	17.8	16	08/27/98	Grid sample fro
380REW98	E39156-1	278	284	09/08/98	From 375BLD92
381REW98	E39156-2	239	195	09/08/98	From 375BLD92
382REW99	E39230-1	298	293	09/09/98	From 377BLD92
383REW99	E39230-2	327	334	09/09/98	From 377BLD92
386BLD915	E39555-1	251	314/328	09/15/98	PILE SAMPLE
387CLR916	E39555-2	17.2	19	09/16/98	Soil under Deco
<b>CUMULATIVE STATISTICS</b>		<b># Certified</b>	<b># In-house</b>	<b>Avg. Pile Pb level</b>	
<b>FOR PILES ONLY --</b>		<b>Samples</b>	<b>Samples</b>	<b>Certified (ppm)</b>	
<b>NOT GRID POINTS OR</b>		<b>136</b>	<b>132</b>	<b>299</b>	
<b>AREAS</b>					



**TABLE 5 - SOUTH SITE WATER SAMPLING**

<b>SAMPLE NO.</b>	<b>START DATE/TIME</b>	<b>END DATE/TIME</b>	<b>TOTAL LEAD</b> <b>(ppm)</b>	<b>pH</b>	<b>TSS</b> <b>(ppm)</b>	<b>VOLUME</b> <b>(GAL)</b>
H2O94AB	9/4/97 10:40	9/5/97 07:15	0.16	6.7	80	78,440
H2O95A	9/5/97 9:00	9/6/97 11:00	0.17	6.8	108	78,840
H2O96A	9/6/97 11:00	9/7/97 10:00	0.27	6.4	120	32,720
H2O97A	9/7/97 10:00	9/8/97 11:30	0.36	6.7	136	10,600
H2O98A	9/8/97 14:30	9/9/97 8:00	0.22	7.6	244	69,400
H2O99A	9/9/97 8:00	9/10/97 7:15	0.24	6.4	236	69,200
H2O910A		9/11/97 7:15	0.29	6.4	212	23,900
H2O911A	9/11/97 07:15	9/12/97 7:45	0.32	6.6	208	81,100
H2O912A	9/12/97 7:45	9/13/97 10:00	0.43	6.4	240	81,700
H2O913A	9/13/97 10:00	9/14/97 14:30	0.45	6.5	264	23,000
H2O914A	9/14/97 14:30	9/15/97 7:20	0.44	6.6	274	47,200
H2O915A	9/15/97 7:20	9/16/97 7:20	0.45	6.5	352	78,100
H2O916A	9/16/97 7:20	9/17/97 7:30	0.59	6.5	370	45,800
H2O917A	9/17/97 7:30	9/17/97 13:00	0.5	8.1	316	50,000
H2O918A	9/18/97 11:00	9/19/97 7:15	0.47	6.2	476	50,000
H2O919A	9/19/97 7:15	09/20/97 12:15	0.49	7.5	312	48,300
Note: Daily volumes for 9/17, 9/18 and 9/19 are estimated					<b>SEP.</b>	<b>868,300</b>
H2O1020A	10/20/97 10:00	10/20/97 13:00	0.16	5.9	260	8,000
H2O1021A	10/21/97 11:00	10/21/97 14:00	2.59	6.6	724	10,500
H2O1022A	10/22/97 08:00	10/22/97 11:30	2.52	7.4	834	4,300
H2O1028A	10/28/97 13:30	10/28/97 13:30	0.14	6.7	198	
H2O1030A	10/30/97 08:00	10/30/97 14:45	0.31	6.0	269	2,800
H2O1031A	10/31/97 08:00	10/31/97 14:45	0.76	5.7	237	900
					<b>OCT.</b>	<b>26,500</b>
H2O1224A	12/24/97 09:15	12/24/97 11:30	0.20	9.0	596	700
					<b>DEC.</b>	<b>700</b>
H2O114A	1/14/98 10:30	1/15/98 07:30	0.25	8.0	11	49,300
H2O115A	1/15/98 07:30	1/15/98 12:00	0.22	8	11	7,500
					<b>JAN.</b>	<b>56,800</b>
H2O212A	2/12/98 10:00	2/12/98 11:00	0.24	5.5	6	2,800
H2O218A	2/18/98 07:45	2/19/98 07:15	0.17	7.3	8	18,100
H2O219A	2/19/98 07:15	2/19/98 16:00	0.11	7.3	4	14,000
H2O219B	2/19/98 16:00	2/20/98 07:00	<0.10	7.3	5	14,900
H2O220A	2/20/98 07:00	2/20/98 11:30	<0.10	7.6	6	4,700
					<b>FEB.</b>	<b>54,500</b>
H2O35A	3/5/98 14:00	3/5/98 16:30	0.21	7.1	15	5,900
H2O35B	3/5/98 16:30	3/6/98 07:15	0.10	7.1	5	37,600
H2O36A	3/6/98 07:15	3/6/98 18:00	0.15	7.2	21	27,100
H2O36B	3/6/98 18:00	3/7/98 06:30	<0.10	7.2	3	31,300
H2O37A	3/7/98 06:30	3/7/98 15:00	0.12	7.1	3	21,100
H2O37B	3/7/98 15:00	3/8/98 14:00	<0.10	7.0	3	55,300
H2O38A	3/8/98 14:00	3/9/98 07:30	0.14	6.9	28	40,800
H2O39A	3/9/98 07:30	3/10/98 07:30	0.11	6.8	20	59,000
H2O10A	3/10/98 07:30	3/11/98 07:30	<0.10	7.4	11	60,700

**TABLE 5 - SOUTH SITE WATER SAMPLING**

SAMPLE NO.	START DATE/TIME	END DATE/TIME	TOTAL LEAD (ppm)	pH	TSS (ppm)	VOLUME (GAL)
H2O311A	3/11/98 07:30	3/12/98 07:30	0.14	6.9	7	60,400
H2O312A	3/12/98 07:30	3/13/98 07:30	0.13	6.8	4	60,300
H2O313A	3/13/98 07:30	3/14/98 07:30	<0.10	7.1	3	59,400
H2O314A	3/14/98 07:30	3/15/98 12:30	<0.10	6.8	2	72,400
H2O315A	3/15/98 12:30	3/16/98 07:30	<0.10	6.8	1	45,700
H2O316A	3/16/98 07:30	3/17/98 07:30	0.18	6.7	3	58,400
H2O317A	3/17/98 07:30	3/18/98 07:30	0.25	6.6	5	57,600
H2O318A	3/18/98 07:30	3/18/98 07:30	0.27	6.4	5	55,900
H2O319A	3/19/98 07:30	3/20/98 07:30	0.25	6.8	10	36,900
H2O320A	3/20/98 07:30	3/20/98 15:00	0.28	7.0	2	7,300
H2O320B	3/20/98 15:00	3/21/98 11:30	0.35	6.6	14	53,500
H2O321A	3/21/98 11:30	3/22/98 14:00	0.27	6.6	6	68,600
H2O322A	3/22/98 14:00	3/23/98 07:30	0.23	6.7	2	44,800
H2O323A	3/23/98 07:30	3/24/98 07:30	0.24	6.6	3	61,800
H2O324A	3/24/98 07:30	3/25/98 07:30	0.29	6.6	2	61,600
H2O325A	3/25/98 07:30	3/26/98 07:30	0.22	6.7	2	61,500
H2O326A	3/26/98 07:30	3/27/98 07:30	0.35	7.2	3	60,700
H2O327A	3/27/98 07:30	3/28/98 07:30	0.25	7	2	65,000
H2O328A	3/28/98 07:30	3/29/98 11:00	0.22	6.8	1	68,200
H2O329A	3/29/98 11:00	3/30/98 07:30	0.23	7	2	47,300
H2O330A	3/30/98 07:30	3/31/98 07:30	0.22	6.9	3	51,800
H2O331A	3/31/98 07:30	4/1/98 07:30	0.29	7.3	4	54,800
					<b>MAR.</b>	<b>1,552,700</b>
H2O41A	4/1/98 07:30	4/2/98 07:30	0.31	7.2	4	55,800
H2O42A	4/2/98 07:30	4/3/98 07:30	0.32	7.1	1	54,400
H2O43A	4/3/98 07:30	4/4/98 12:30	0.23	6.7	2	70,900
H2O44A	4/4/98 12:30	4/5/98 12:00	0.27	7.2	2	56,000
H2O45A	4/5/98 12:00	4/6/98 07:30	0.25	6.6	1	46,600
H2O46A	4/6/98 07:30	4/7/98 07:30	0.23	6.6	14	60,000
H2O47A	4/7/98 07:30	4/8/98 07:30	0.34	6.5	6	64,500
H2O48A	4/8/98 07:30	4/9/98 07:30	0.31	6.8	4	63,800
H2O49A	4/9/98 07:30	4/10/98 07:30	0.37	6.7	8	37,000
H2O410A	4/10/98 07:30	4/11/98 07:30	0.25	6.5	3	46,700
H2O411A	4/11/98 07:30	4/12/98 12:30	0.27	6.5	3	72,800
H2O412A	4/12/98 12:30	4/13/98 07:30	0.23	6.5	6	47,600
H2O413A	4/13/98 07:30	4/14/98 07:30	0.33	6.6	1	55,600
H2O414A	4/14/98 07:30	4/14/98 17:30	0.38	6.7	21	15,500
H2O415A	4/15/98 09:30	4/16/98 07:30	0.23	6.8	4	59,400
H2O416A	4/16/98 07:30	4/17/98 07:30	0.3	6.9	9	60,000
H2O417A	4/17/98 07:30	4/18/98 07:30	0.26	6.6	5	35,300
H2O418A	4/18/98 07:30	4/19/98 11:30	0.33	6.8	2	55,600
H2O419A	4/19/98 11:30	4/20/98 07:30	0.28	6.5	2	18,300
H2O420A	4/20/98 20:00	4/21/98 07:30	0.25	6.7	6	29,000
H2O421A	4/21/98 07:30	4/22/98 07:30	0.34	6.9	8	56,100
H2O422A	4/22/98 07:30	4/23/98 07:30	0.26	6.5	8	20,600
H2O423A	4/23/98 07:30	4/24/98 07:30	0.34	6.7	15	9,800
H2O424A	4/24/98 07:30	4/25/98 07:30	0.31	6.9	7	42,100
H2O425A	4/25/98 07:30	4/26/98 16:00	0.28	6.9	2	71,700
H2O427A	4/27/98 07:30	4/28/98 07:30	0.38	6.6	2	52,000

**TABLE 5 - SOUTH SITE WATER SAMPLING**

SAMPLE NO.	START DATE/TIME	END DATE/TIME	TOTAL LEAD (ppm)	pH	TSS (ppm)	VOLUME (GAL)
H2O428A	4/28/98 07:30	4/29/98 07:30	0.30	6.8	4	38,000
H2O429A	4/29/98 07:30	4/30/98 07:30	0.23	6.9	7	24,900
H2O430A	4/30/98 07:30	5/1/98 10:00	0.28	6.6	3	27,000
					<b>APR.</b>	<b>1,347,000</b>
H2O51A	5/1/98 10:00	5/2/98 07:30	0.35	6.4	1	20,900
H2O52A	5/2/98 07:30	5/3/98 11:00	0.32	6.7	2	27,900
H2O53A	5/3/98 11:00	5/4/98 07:30	0.37	6.8	1	27,100
H2O54A	5/4/98 07:30	5/5/98 07:30	0.47	6.7	4	32,600
H2O55A	5/5/98 07:30	5/6/98 07:30	0.43	6.8	3	32,500
H2O56A	5/6/98 07:30	5/7/98 07:30	0.27	7.1	1	32,300
H2O57A	5/7/98 07:30	5/8/98 07:30	0.33	6.9	3	30,400
H2O58A	5/8/98 07:30	5/9/98 16:30	0.24	NA	4	39,300
H2O510A	5/9/98 16:30	5/10/98 13:30	0.25	NA	31	63,100
H2O511A	5/10/98 13:30	5/11/98 09:50	0.29	NA	19	61,700
HO2512A	5/11/98 09:50	5/12/98 22:00	0.20	NA	5	72,800
					<b>MAY</b>	<b>440,600</b>
H2O513A	7/2/98 08:00	7/2/98 17:00	<0.01	7.1	<1	1,100
					<b>JUN</b>	<b>1,100</b>
<b>KEY:</b>					<b>TOTAL</b>	<b>4,348,200</b>
Example:	Sample number	H2O55A				
	H2O	Water sample				
	55	Start Date (May 5)				
	A	First composite (alpha. order)				

# **APPENDIX A**

## **PERMITS**



**CROUSE**

.....  
400 Penn Center  
Boulevard  
.....

Suite 600  
.....

Pittsburgh, PA  
15235  
.....

Phone  
412 - 823-5200  
.....

Fax  
412 - 823-9234  
.....

.....  
A Crouse Enterprises  
Company

**CE Consultants, Inc.**

***Remedial Action Work Plan***

***Prepared for:***

***Lenox. Incorporated***

***Project No. C0020  
October 16, 1996***

## Table of Contents

### **Crouse Enterprises, Inc.**

#### *Remedial Action Work Plan*

	<u>Page</u>
1.0 Introduction	1
2.0 Remedial Investigation	1
2.1 Field Activities	1
2.1.1 Background Sample Locations	2
2.1.2 Flat Area Sample Locations	2
2.1.3 Pit	3
2.1.4 Dredge Sample	3
2.1.5 Quality Assurance Samples	4
2.1.6 Sampling Equipment Decontamination Procedure	4
2.1.7 Groundwater	4
2.2 Discussion of Results	4
2.3 Certification	5
3.0 Remedial Action	5
3.1 Remedial Action Work Plan (RAW) Requirements	5
3.2 Applicable Remediation Standards	6
3.3 Remedial Action Description	6
3.4 Confirmatory Soil Sampling	7
3.5 Geoprobe Investigation	7
3.6 Equipment Decontamination	7
3.7 Waste Disposal	8
3.8 Plans	8
3.9 Project Schedule	9
Tables	
Table 1 Soil Sample Data	
Figures	
Figure 1 - Site Plan	
Attachments	
Attachment A - Analytical Data	
Attachment B - Certification	

**Remedial Action Work Plan  
Lenox, Incorporated  
Pomona, New Jersey**

**1.0 Introduction**

The project site (South Site) is located directly south of the Lenox China (Lenox) facility on Tilton Road in Pomona, Galloway Township, New Jersey. The South Site is not part of the Lenox facility, rather it is an approximate one acre tract of land which is contiguous to the Lenox facility as shown in Figure 1.

The South Site was utilized by Lenox to store waste plaster molds and broken ware from approximately 1954 to the late 1970s. The extent of the South Site, materials stored and the dates of operation were determined by a review of historic aerial photographs and through an interview with a former employee. These photographs and the interview indicate that all waste materials were placed on the surface of the South Site with the only exception being a small pit on the north end of the South Site. It is estimated that this pit was a maximum of six feet deep with an area of less than 0.1 acre.

Recently, Lenox personnel were informed by the property owner that the property which includes the South Site will be developed. The owner is currently seeking approvals for construction of a continuing care retirement facility on this property.

Lenox personnel recently walked the property and small amounts of broken china and plaster molds are visible on the surface. Lenox retained CE Consultants, Inc. (CE Consultants) to perform a remedial soil investigation for the purpose of determining the extent to which site soils had been affected by the china. This investigation is described in Section 2 below.

**2.0 Remedial Investigation**

**2.1 Field Activities**

CE Consultants personnel conducted the remedial investigation (RI) on September 10 and 11, 1996, and this RI generally followed the requirements of N.J.A.C. 7:26E-3.6. Soil samples were collected from 13 locations in and around the South Site as shown in

Figure 1. Additionally, the samples were analyzed for zinc because it is also used in the manufacturing process and would be indicative of metallic contamination at the site.

#### 2.1.1 Background Sample Locations

Background Sample Locations SS-1, SS-2, and SS-3 are located within the wooded areas to the west, south, and east of the South Site, respectively. Three separate soil samples (0 to 6 inches, 6 to 12 inches, and 12 to 18 inches) were collected at each location. The 0 to 6 inch and 6 to 12 inch samples were submitted to Accutest Laboratories (Accutest) in Dayton, New Jersey for analysis of total lead and zinc. The 12 to 18 inch samples were archived.

In general, soil at the background locations consisted of gray sand to a depth of approximately 4 to 6 inches followed by brown sand to the bottom of the auger boring. Gravel was present in the sand at some locations. No pieces of china or plaster were observed in any of the background samples which appeared in all respects to be natural soil unaffected by human activity.

#### 2.1.2 Flat Area Sample Locations

Soil samples were collected from 8 locations within the flat area (Flat Area) of the South Site that comprises approximately 90 percent of the total site. Three separate soil samples (0 to 6 inches, 6 to 12 inches, and 12 to 18 inches) were collected at each location. The 0 to 6 inch and 6 to 12 inch samples were submitted to Accutest for analysis of total lead and zinc. The 12 to 18 inch samples were archived.

In general, the ground surface in the Flat Area (at each sampling location) has discrete pieces of china and plaster up to approximately 2 inches in size with most pieces being less than 1 inch. At most of the sampling locations, these pieces of china were limited to the upper 3 to 4 inches of the soil profile which consisted of sand and gravel. Soil samples from the 0 to 6 inch interval were sieved through an approximate 1 millimeter sieve to remove the china pieces from the sample.

Soil samples from the 6 to 12 inch interval consisted of brown sand and gravel. Pieces of china were detected in this interval at only two sample locations (SS-9 and SS-10). At Sample Location SS-9, there were a few pieces of china approximately 1/2-inch in size, which were sieved out of the sample. Similar conditions were present at Sample Location SS-10; however, the soil at Sample Location SS-10 was clayey and could not be sieved.



Hand auguring continued at the Sample Location SS-10 location with samples collected every 6 inches until a china-free interval was reached. This occurred at a depth of 30 to 36 inches. These additional samples were archived.

#### 2.1.3 Pit

A pit (Pit) was identified on the South Site. Hand-auger borings were placed at two sample locations (SS-12 and SS-13) in this area. The Pit area is on the western bank of the existing surface water retention basin. The approximate location of the Pit is shown in Figure 1.

At Sample Location SS-12, china pieces were present in the soil (sand) at a depth of 30 inches. The china pieces were very abundant at 52 inches and auger refusal was encountered in china at a depth of 54 inches. Conditions were similar at soil Sample Location SS-13 with china chips first encountered at a depth of 34 inches, becoming abundant at 50 inches, with auger refusal at 52 inches. Two samples from Sample Location SS-12 (0 to 30 inches and 30 to 54 inches) and two samples from Sample Location SS-13 (0 to 34 inches and 34 to 52 inches) were submitted for laboratory analyses.

#### 2.1.4 Dredge Sample

On September 11, 1996, a contractor for the property owner was using an excavator to muck-out the existing surface water retention basin. Several buckets of the dredged sediment removed from the basin near the Pit contained china pieces. One bucket contained abundant china pieces. A sample of the dredgings was collected and submitted for laboratory analysis.

#### 2.1.5 Quality Assurance Samples

Three duplicate samples, 1 matrix spike sample and 2 sampling equipment rinse samples (one per day) were collected and submitted for laboratory analyses.

#### 2.1.6 Sampling Equipment Decontamination Procedure

The soil sampling equipment which included a stainless-steel hand auger, a stainless-steel scoop, and a sieve were decontaminated between samples utilizing the following procedures:

- Remove loose soil
- Detergent wash
- Distilled water rinse
- 20 percent nitric acid solution rinse
- Distilled water rinse

#### 2.1.7 Groundwater

Lead, which is the contaminant of concern at the South Site, is bound in a glass matrix (glaze) on the china. In this form, the lead is not easily mobilized and does not impact groundwater based upon numerous previous investigations performed at the Lenox facility. Moreover, Earth Sciences Consultants, Inc. (Earth Sciences) conducted a groundwater investigation downgradient of the South Site. This groundwater investigation included the permitted installation of three monitoring wells constructed to NJDEP standards which were sampled and analyzed for lead and volatile organic compounds (VOCs). No VOCs were detected in any of the samples and lead levels were well below drinking water standards. A copy of the data obtained is included in Attachment A. For these reasons, groundwater was not investigated during the September 1996 RI.

#### 2.2 Discussion of Results

The soil samples collected on September 10 and 11, 1996 were analyzed by Accutest. These data are summarized in Table 1. Lead and zinc were either not detected or present at concentrations only slightly above detection limits in samples from the three background sampling locations. Elevated concentrations of lead and zinc were present in soil samples collected from the Flat Area and the Pit. In comparing these data to the State of New Jersey residential cleanup standard of 400 milligrams per kilogram (mg/Kg) for total lead and 1,500 mg/Kg for total zinc, it is apparent that the lead standard is exceeded in the

Pit/Dredge Area and at only a few locations in the Flat Area. The zinc standard was not exceeded at any location.

Specifically, all samples from the Pit [SS-12 (0 to 30 inches), SS-12 (30 to 54 inches), SS-13 (0 to 34 inches), SS-13 (34 to 54 inches) and Pond Dredgings] exceeded the residential lead cleanup standard with lead concentrations ranging from 3,270 to 15,500 mg/k. However, only 6 samples from the Flat Area [SS-4 (0 to 6 inches), SS-6 (0 to 6 inches), SS-9 (0 to 6 inches), SS-10 (0 to 6 inches), SS-10 (6 to 12 inches) and SS-11 (0 to 6 inches)] exceeded the lead cleanup standard. Concentrations in these samples ranged from 1,190 milligrams per liter (mg/l) to 15,500 mg/l. Soil samples collected from below the upper 6-inch interval in the Flat Area did not exceed the lead cleanup standard. The only exception was Soil Sample SS-10 (6 to 12 inches).

Pieces of broken china were observed in the upper 3 or 4 inches of the soil profile in the Flat Area and to a depth of 30 inches at Sample Location SS-10. It should be noted that while all samples which exceeded the cleanup standard contained china chips, not all samples which contained china chips exceeded the standard. In general, it appears that the presence of china pieces can be used as a visual indicator in guiding remedial action at the site.

### 2.3 Certification

The nature and extent of the South Site and the vertical and horizontal extent of lead in soils has been adequately determined for the purpose of initiating remedial action at this site based on our best professional judgment. A certification statement is attached as Attachment B.

## 3.0 Remedial Action

### 3.1 Remedial Action Work Plan(RAW) Requirements

This RAW was prepared in conformance with the requirements of N.J.A.C. 7:26E-6. The horizontal extent of the contaminated area was determined based on visual observations at the site, interviews with knowledgeable plant personnel, review of historical aerial photographs and soil sampling conducted during the RI. The remedial work will be performed in accordance with the requirements of New Jersey Department of Environmental Protection (NJDEP) regulations and using best professional judgment. Following excavation of contaminated soil (estimated at 800 cubic yards), samples will be

collected at the locations shown in Figure 1 to confirm that the area has been adequately remediated. Additionally, groundwater quality will be investigated utilizing geoprobe borings as described in Section 3.5 below.

### 3.2 Applicable Remediation Standards

Lead is the only constituent of concern in soils at the site. The applicable remediation standards are the NJDEP Direct Contact Soil Cleanup Criteria (SCC) for residential properties. These standards are presented in NJDEP's February 3, 1992 Cleanup Standards for Contaminated Sites (N.J.A.C. 7:26D). Based on these standards, the current SCC for lead at residential properties is 400 mg/Kg.

### 3.3 Remedial Action Description

Remedial action at the South Site will consist of excavation and off-site disposal of soil/china in the Pit/Dredge Area. The soil/china from the Pit/Dredge Area will be removed utilizing an excavator and/or loader. Excavation will continue until unaffected (nonchina-containing) soils are encountered. The soil/china will be loaded into lined and covered roll-off containers and stored on Lenox property pending laboratory analysis. Based on the laboratory results, the excavated material will be disposed/recycled at an appropriate off-site facility.

The remaining remedial action at the South Site will consist of removal of the china chips in the upper 6 inches of soil in the Flat Area. The china chips will be removed utilizing screening equipment. The removed china chips will be disposed/recycled at an appropriate off-site facility.

Remedial activities will be verified through the collection and laboratory analysis of confirmation soil samples. The number and location of the confirmation samples will be as shown in Figure 1. If these surfacial samples indicate that lead contamination above the 400 mg/Kg residential cleanup level remains, additional soil will be removed followed by a second round of confirmation sampling.

Soil at the South Site consists primarily of sand having a relatively high permeability and the site is generally flat. Therefore, it is not expected that surface water runoff will pose a problem. In fact, surface water runoff from the area around the South Site is currently directed to a drainage swale on the South Site (Figure 1) where it infiltrates into the

subsurface. Considering these conditions, erosion and sedimentation control for the remedial action will consist of seeding and mulching.

### 3.4 Confirmatory Soil Sampling

Following excavation of contaminated soil at the South Site, confirmatory soil samples will be collected and analyzed for total lead. These samples will be collected based on a approximate 70-foot by 70-foot square grid as shown in Figure 1. Grid sampling locations will be supplemented by several additional samples placed to ensure adequate delineation of the horizontal limits of the area and/or as necessary based on field observations at the time of remediation.

### 3.5 Geoprobe Investigation

A geoprobe investigation will be conducted (after confirmation soil sampling proves the site soils are below the cleanup level) to collect groundwater samples for purposes of confirming the previous investigation conducted by Earth Sciences. Groundwater flow at the Lenox facility is toward the northeast. Three geoprobe borings will be drilled hydraulically downgradient of the South Site. The approximate geoprobe drilling locations are shown in Figure 1.

A geoprobe is a hydraulically-powered percussion/probing machine specifically designed for use in the environmental industry. The geoprobe uses direct push technology to insert sampling tools into the ground without the use of a drilling method to remove the soil and make a path for the sampling tool. Direct push technology relies on the static weight of the vehicle upon which the unit is mounted combined with the percussive force of the hydraulic hammer. Groundwater samples are collected by inserting plastic tubing through geoprobe rods and utilizing a peristaltic pump to extract the water sample from the subsurface and place it directly into the sample container.

### 3.6 Equipment Decontamination

An equipment decontamination area will be set up near the South Site at the approximate location shown in Figure 1. A 50-mil plastic liner will be used to construct a 16-foot by 24-foot decontamination pad for purposes of collecting the decontamination fluids. Loose soil will be removed from the equipment (and ultimately the decontamination area) and disposed with the contaminated soil from the South Site. The equipment will be pressure washed and the washwater will be collected for treatment at Lenox's on-site lead bearing

wastewater treatment plant which discharges to the Atlantic County Utility Authority (ACUA) sanitary system.

All sampling equipment, such as the geoprobe rods, soil trowels, etc., will be decontaminated by the same procedure utilized in the RI which includes:

- Remove loose soil
- Detergent wash
- Distilled water rinse
- 20 percent nitric acid solution rinse
- Distilled water rinse

The decontamination fluids will be collected into 55-gallon drums and transported to the on-site wastewater treatment plant.

### 3.7 Waste Disposal

Soil removed from the South Site will be placed in lined and tarped roll-off containers having sealed end gates and temporarily stored in one of the parking areas at the Lenox facility pending analysis. The roll-off containers will be sampled and analyzed to determine whether or not the soil is hazardous and the soil will be disposed/recycled at an appropriate off-site disposal/recycling facility. These facilities will include Chemical Waste Management, Chemical Services facilities in Model City, NY or Emille, Alabama (for hazardous waste); the ACUA landfill in Eggharbor Township, New Jersey (for residual waste); or A.E. Stone, Inc., an asphalt plant, located in Egg Harbor Township (if recycling is appropriate).

### 3.8 Plans

All required plans (Health & Safety, Sampling & Analysis, Quality Assurance/Quality Control) will be based upon those previously submitted and approved by the NJDEP for the Lenox site.

### 3.9 Project Schedule

Lenox has requested that the NJDEP conduct an expedited review and approval of this RAWP in order that the work may be completed prior to the 1996/1997 Winter season. Assuming that approvals of this RAWP are received by October 30, 1996, Lenox will adhere to the following schedule:

Item	Elapsed Time from Receipt of NJDEP Approval (Weeks)
Contract with Construction and Disposal/Recycle Firms and Notify NJDEP of Starting Date of Field Activities	3
Start Field Removal	4
Complete Field Removal and Store Wastes and Notify NJDEP of Starting Date of Geoprobe Activities	6
Geoprobe Testing	7 to 9
Receipt Analytical Results	7
Ship Wastes	9
Submit Remedial Action Report to NJDEP	11

**Table 1**  
**Soil Sample Data**  
**Lenox Incorporated**  
**Pomona, New Jersey**

	Sample Location Designation	Sample Depth	Total Lead mg/Kg	Total Zinc mg/Kg
Background Samples	SS-1	(0-6")	<10	<2.0
	SS-1	(6-12")	<10	3.3
	SS-2	(0-6")	12.5	<2.1
	SS-2	(6-12")	<11	6.2
	SS-3	(0-6")	25.4	2.2
	SS-3	(6-12")	<11	4.6
Flat Area Samples	SS-4	(0-6")	2,680/3,580	92.2/93.9
	SS-4	(6-12")	12.0	2.5
	SS-5	(0-6")	92.9	6.4
	SS-5	(6-12")	<10	2.5
	SS-6	(0-6")	7,300	136
	SS-6	(6-12")	11.0	4.2
	SS-7	(0-6")	40.3	12.0
	SS-7	(6-12")	<10	3.0
	SS-8	(0-6")	246	9.1
	SS-8	(6-12")	<11	2.2
	SS-9	(0-6")	1,190	39.2
	SS-9	(6-12")	40.8	3.7
	SS-10	(0-6")	1,860	45.2
	SS-10	(6-12")	1,850	49.4
	SS-11	(0-6")	15,500/15,500	283/286
	SS-11	(6-12")	96.3	10.1
Pit	SS-12	(0-30")	3,270	228
	SS-12	(30"-54")	7,940/9,020	461/456
	SS-13	(0-30")	7,630	383
	SS-13	(30"-52")	15,500	528
Pond Dredgings			11,300	291

**Note:**

1. Samples were collected on 9/10/96 and 9/11/96.
2. Results of duplicate analysis are separated by a backslash.



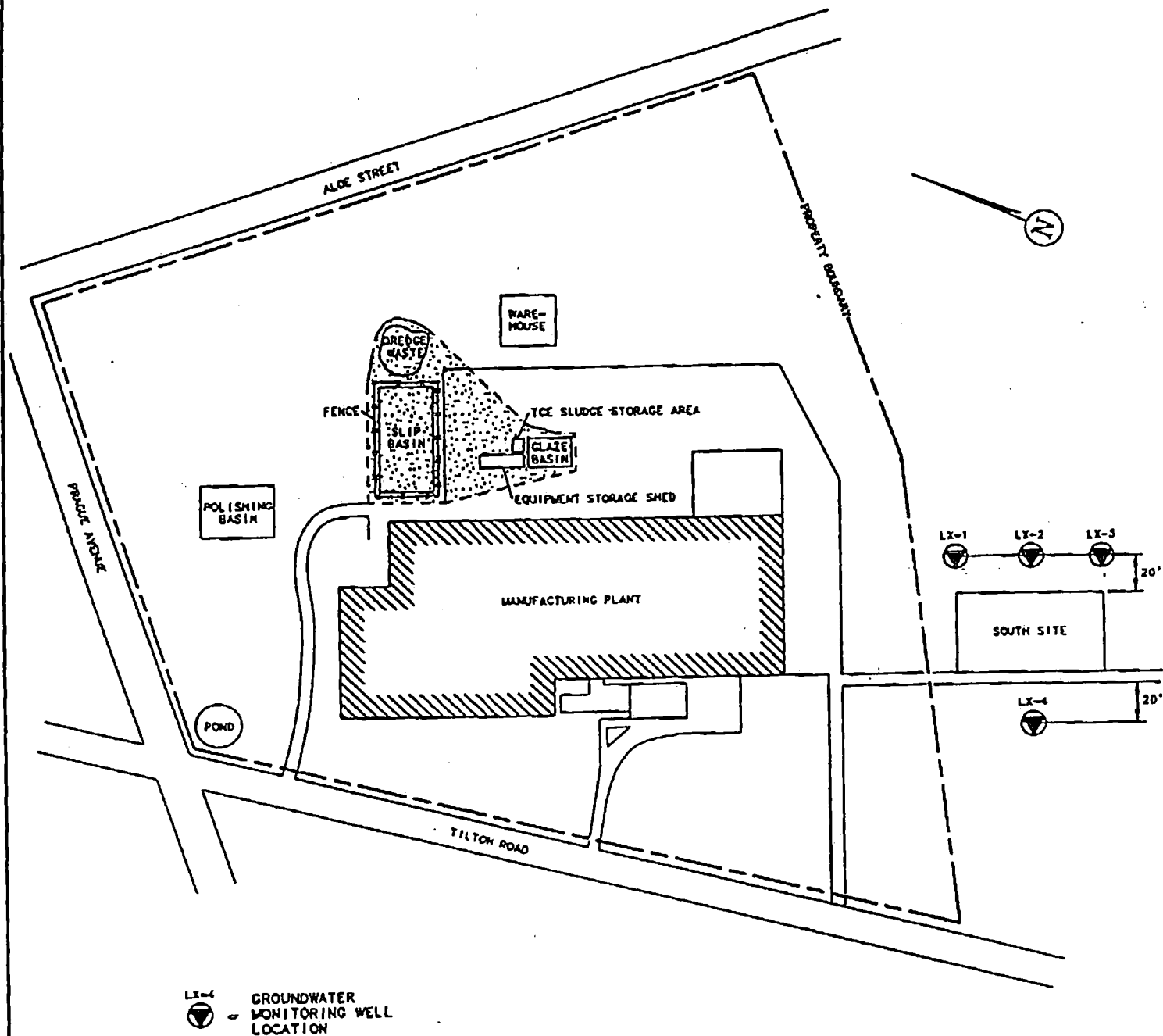
Tab. I  
 Results of Chemical Analyses  
 October 17, 1989 Groundwater Samples  
 Lenox China, Inc.  
 Pomona, New Jersey

Parameter	Units	Sample Identification					
		LX-1	LX-2	LX-3	LX-4	Trip Blank	Field Blank
Total Lead	mg/l	0.015	0.002	0.013	<0.001	<0.001	<0.001
Dissolved Lead	mg/l	0.004	<0.001	0.001	<0.001	<0.001	<0.001
pH	pH units	5.70	5.30	4.10	4.80	6.40	6.90
Specific Conductance @ 25°C	µmhos/cm	290	1,500	1,100	45	2	2
Trichloroethene(1)	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

(1) EPA Method 601.

Table 2  
Groundwater Volatile Organic Analysis Data  
August 31, 1989 Samples  
Lenox China, Inc.  
Pomona, New Jersey

Parameter	Units	Sample Identification			
		LX-1	LX-2	LX-3	LX-4
Volatile Organic Analyses:					
Acrolein	g/l	<250	<250	<250	<250
Acrylonitrile	g/l	<250	<250	<250	<250
Benzene	g/l	<5	<5	<5	<5
Carbon Tetrachloride	g/l	<5	<5	<5	<5
Chlorobenzene	g/l	<5	<5	<5	<5
1,2-Dichloroethane	g/l	<5	<5	<5	<5
1,1,1-Trichloroethane	g/l	<5	<5	<5	<5
1,1-Dichloroethane	g/l	<5	<5	<5	<5
1,1,2-Trichloroethane	g/l	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	g/l	<5	<5	<5	<5
Chloroethane	g/l	<5	<5	<5	<5
2-Chloroethylvinyl Ether	g/l	<5	<5	<5	<5
Chloroform	g/l	<5	<5	<5	<5
1,1-Dichloroethene	g/l	<5	<5	<5	<5
Trans-1,2-Dichloroethene	g/l	<5	<5	<5	<5
1,2-Dichloropropane	g/l	<5	<5	<5	<5
1,3-Dichloropropene	g/l	<5	<5	<5	<5
Ethylbenzene	g/l	<5	<5	<5	<5
Methylene Chloride	g/l	<5	<5	<5	<5
Chloromethane	g/l	<5	<5	<5	<5
Bromomethane	g/l	<5	<5	<5	<5
Bromoform	g/l	<5	<5	<5	<5
Dichlorobromomethane	g/l	<5	<5	<5	<5
Chlorodibromomethane	g/l	<5	<5	<5	<5
Tetrachloroethene	g/l	<5	<5	<5	<5
Toluene	g/l	<5	<5	<5	<5
Trichloroethene	g/l	<5	<5	<5	<5
Vinyl Chloride	g/l	<5	<5	<5	<5



DRAWING NOT TO SCALE

# FIGURE 1 GROUNDWATER MONITORING WELL LOCATION PLAN

PREPARED FOR  
LENOX, INC.  
LAWRENCEVILLE, NEW JERSEY

APPROVED *[Signature]* 11/16/83  
CHECKED *[Signature]* 11/16/83  
DRAWING NUMBER




**Certifications**  
**South Site Remedial Action Plan**  
**Lenox Incorporated**  
**Pomona, New Jersey**


- A. The following certification shall be signed by the highest ranking individual with overall legal responsibility for implementing the remediation of a site, but shall not include contractors or consultants:

"I certify under penalty of law that the information provided in this document is true, accurate, and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Senior Vice President and  
President,

Printed Name Jerome J. Ciszewski Title Lenox Operations

Signature  Date 10/17/96

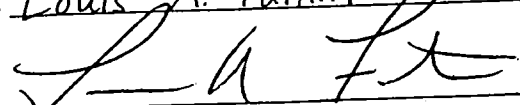
Notary Signature  Date 10/17/96

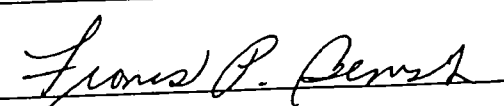
FRANCES P. BENISH  
Notary Public of New Jersey  
My Commission Expires June 20, 1998

- B. The following certification for a corporation shall be signed by a principal executive officer of at least the level of vice president.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and all attached documents, and that based on my inquiries of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Printed Name Louis A. Fantin Title Vice President,  
Secretary and Lenox Counsel

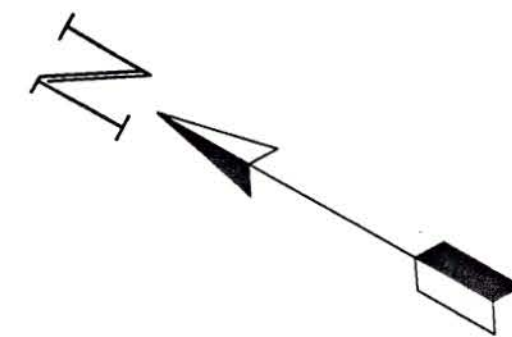
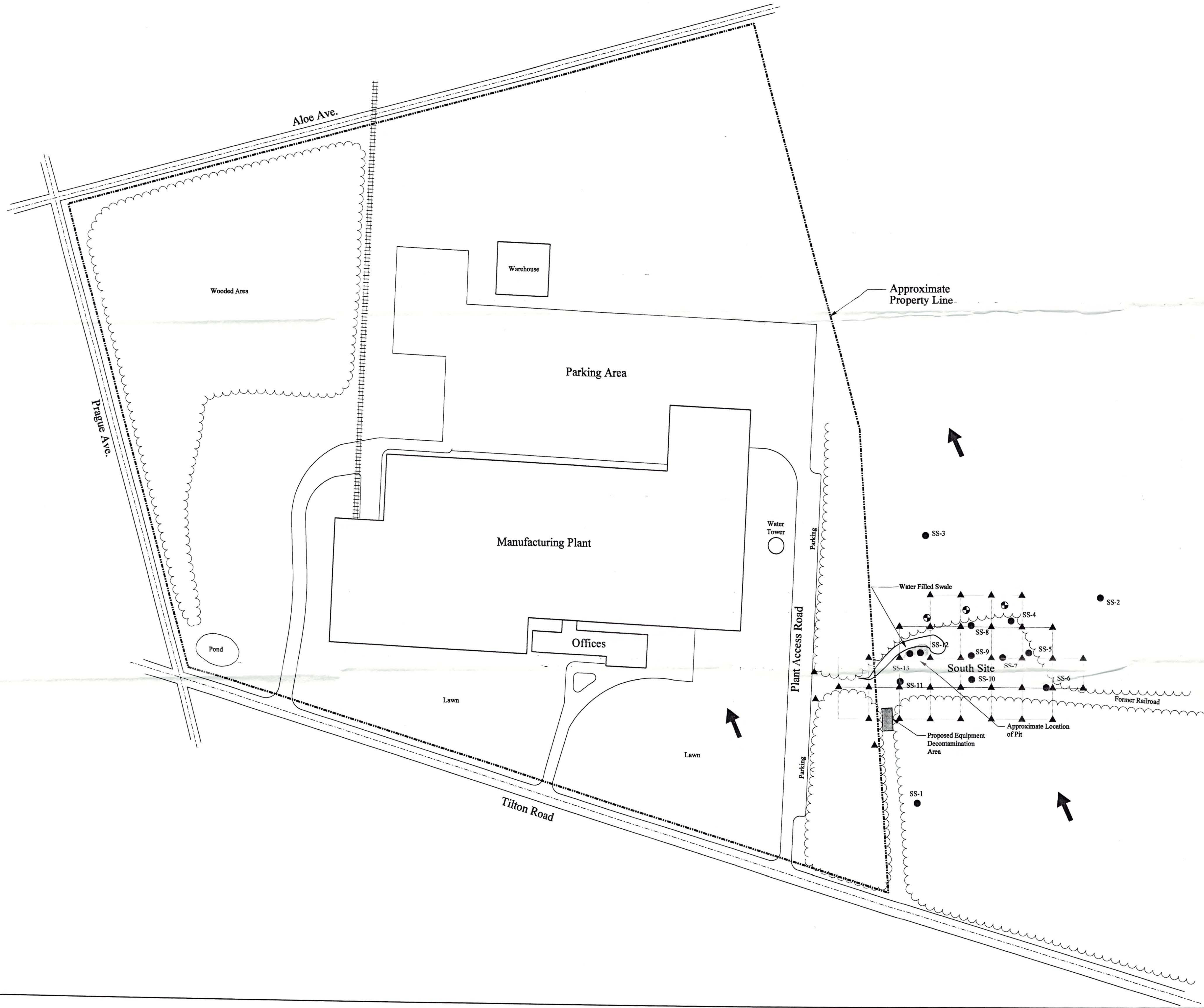
Signature  Date 10/17/96

Notary Signature  Date 10/17/96

FRANCES P. BENISH  
Notary Public of New Jersey  
My Commission Expires June 20, 1998



PLOTTED: OCT '96



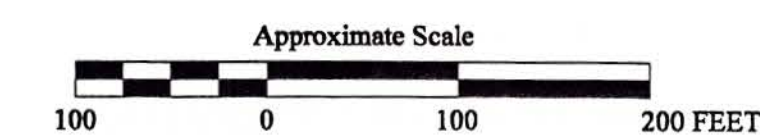
- LEGEND**
- SS-13 Soil Sampling Location
  - ⊕ Proposed Geoprobe Drilling Location
  - ▲ Proposed Confirmation Soil Sampling Locations
  - ➔ Approximate Groundwater Flow Direction

**Note:**

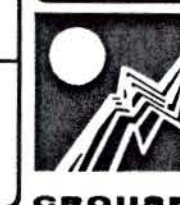
The location of the South Site and soil sampling locations SS-1 through SS-13 are approximate. Only major buildings/structures at the Lenox facility are shown on this drawing.

**Reference:**

Drawing entitled "Plot Plan" dated 8/20/86  
 Developed by IMC, Inc. 687 West Lancaster Ave.  
 Strafford Wayne, PA 19087



REV.			DATE	DESCRIPTION
DRN.	TJH		10/11/96	
CHK.				
APP.				
PROJECT NO.: C0022				PROJECT: Lenox China Pomona, NJ
				SHEET TITLE: Figure 1 Site Plan
Lenox Incorporated				DRAWING NO.: CE0291





**AMENDMENT TO MEMORANDUM OF AGREEMENT**  
**IN THE MATTER OF THE TILTON ROAD SITE AND LENOX CHINA**  
**DATED OCTOBER 11, 1995 - CASE NO. 95-6-29-0905-37**

The above captioned Memorandum of Agreement will be amended as follows:

- 1.1. For purposes of this Memorandum of Agreement a certain portion of Block 453, Lot 2 on the tax maps of the Township of Galloway, Atlantic County, New Jersey as shown on attached Figure 1 shall hereinafter be referred to as the "South Site".
- 6.1. Paragraph 6 above shall apply to the Site as defined in Paragraph 1 of this Memorandum of Agreement. As to the South Site defined in Paragraph 1.1. above, Lenox China agrees to submit and the Department agrees to review and approve the following documents:
  - a. Remedial Action Workplan.
  - b. Remedial Action Report for Remedial Action Workplan activities within thirty (30) calendar days after completion of Remedial Action Workplan activities.
- 6.2. The Department agrees that no further Remedial Investigation is necessary with respect to the South Site and that the cost summary described in Paragraph 12 of this Memorandum of Agreement is not required for the South Site.

**NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION**

Date: \_\_\_\_\_

By: \_\_\_\_\_

Mark J. Pedersen, Section Chief  
DRPSR Case Assignment Section

**LENOX CHINA**

Date: 10/17/96

By: \_\_\_\_\_

Signature

Jerome J. Ciszewski

Print Full Name Signed Above

Senior Vice President and President, Lenox Manufacturing Operations

Title

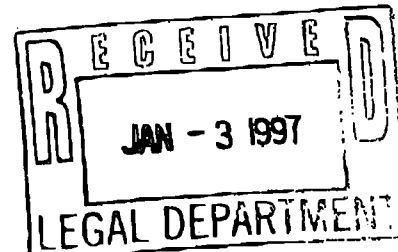
**State of New Jersey**

THE PINELANDS COMMISSION

PO Box 7

NEW LISBON NJ 08064

(609) 894-9342

CHRISTINE TODD WHITMAN  
Governor**CERTIFICATE OF FILING**

January 2, 1997

Louis Fantin  
Lenox, Incorporated  
100 lenox Drive  
Lawrenceville, NJ 08648Please Always Refer To  
This Application NumberRE: App. No. 87-0690.10  
Block 453, Lots 1 & 2  
Galloway Township

Dear Mr. Fantin:

This application for the removal of approximately 800 cubic yards of contaminated soils and debris from the above referenced 94.34 acre parcel in Galloway Township is complete. There is an existing manufacturing plant on Block 453, lot 1. The parcel is located in a Regional Growth Area.

The completion of this application has resulted in the issuance of this Certificate of Filing. This Certificate of Filing is required before any other agency can deem an application complete and take action on your proposed development. The agency may proceed to review and take action on the proposed development. The agency must give notice to the Pinelands Commission of any modification of the proposed development and of any approval received for the proposed development within 5 (five) days of the granting of an approval.

The site of the clean-up was previously used for the storage of plaster molds and broken china from the manufacturing facility that is located on Block 453, Lot 1. The proposed remedial activities will consist of the excavation and off-site disposal of approximately 800 cubic yards of contaminated soil. Also proposed is the removal of china and plaster chips in the upper six inches of soil at portions of the site. Pounded water containing trace concentrations of lead in an existing swale within the contaminated area will be pumped into the sanitary sewer sys-

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and an International Biosphere Reserve***New Jersey Is An Equal Opportunity Employer • Printed on Recycled and Recyclable Paper*

tem and conveyed to the Atlantic County Utilities Authority Treatment Plant.

The Site Plan, consisting of Figure 1 in the October 16, 1996 Remedial Action Work Plan, was prepared by CE Consultants, Inc. and dated October 11, 1996.

An application for a golf course and residential development, including the above referenced parcel was previously completed with the Pinelands Commission. The proposed golf course and portions of the residential areas of the application were approved pursuant to the provisions of the Pinelands Comprehensive Management Plan (App. No. 87-0690.01). Local approvals that were issued for portions of the residential development included in that application are currently subject of a Commission staff review.

Application Numbers 87-0690.02, 87-0690.03, 87-0690.04, 87-0690.06, 87-0690.07 and 87-0690.09 concern the development of improvements associated with the club house, golf course and residential development that are the subject of App. No. 87-0690.01.

An application for a Letter of Interpretation concerning the number of Pinelands Development Credits necessary for the residential development subject of App. No. 87-0690.01 was initiated, but not completed, with the Pinelands Commission (87-0690.05).

Applications for the closure of existing glaze basins used in the manufacturing of china on Block 453, Lot 1 (App. No. 85-0666.01), the remediation of groundwater (App. No. 85-0666.02), the closure of a slip basin (App. No. 85-0666.03), the modification of a discharge monitoring structure (App. No. 85-0666.04) and the remediation of contaminated soil (App. No. 85-0666.05) on the lot were previously completed with the Commission.

This application is for the proposed remedial activities only. Any future development such as the construction of a new stormwater retention facility shall be governed by the provisions of the Pinelands Comprehensive Management Plan.

If it is determined that there is any residual contamination of soil or groundwater at the site, the applicant shall notify the Pinelands Commission and the Department of Environmental Protection of this fact. The applicant shall be responsible for initiating the necessary application to the Commission for cleaning up the site within 30 days of discovery of any residual contamination.



No degradation of water quality shall occur. Copies of the results of all groundwater sampling and groundwater monitoring reports shall be submitted to the Pinelands Commission. If the results indicate that the proposed soil remediation is not adequate to protect groundwater from degradation, an application for groundwater remediation shall be submitted to the Pinelands Commission.

Landscaping shall adhere to the requirements of the Pinelands Comprehensive Management Plan. All disturbed areas shall be revegetated within 6 months of completion of construction with sufficient vegetation to stabilize soils.

The soil and china chips removed from the parcel shall be disposed of, treated or re-used at a location outside of the Pinelands Area. A separate application shall be submitted for the placement of this soil on any land within the Pinelands Area.

THIS CERTIFICATE OF FILING IS NOT AN APPROVAL. It is the letter necessary for other agencies to review and act on your application. If either a municipal or county agency grants an approval or permit for the proposed development, that approval is subject to review by the Pinelands Commission. No local approval shall take effect and no construction or development shall occur unless written notice from the Pinelands Commission has been received, indicating either that the Commission will not review the local approval or that the Commission has approved the local approval.

This Certificate of Filing is transferable to future owners of this parcel.

If you have any questions, please contact the development review staff.

Sincerely,



William F. Harrison, Esq.  
Assistant Director

TD

cc: Secretary, Galloway Township  
Galloway Township Construction Code Official  
Atlantic County Policy, Planning and Economic  
Development Office  
Frank Faranca  
Kathleen Swigon  
Todd DeJesus  
Gina Berg



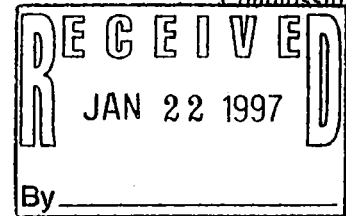
## State of New Jersey

Department of Environmental Protection

Christine Todd Whitman  
Governor

Robert C. Shinn, Jr.  
Commissioner

Division of Water Quality  
401 East State Street  
CN-029  
Trenton NJ 08625  
Fax: (609) 984-7938



Mr. John Kinkela, Director,  
Environmental Engineering  
Lenox Technical Services  
Tilton Road  
Pomona NJ 08240

January 17, 1997

CERTIFIED MAIL  
RETURNED RECEIPT REQUESTED

Dear Mr. Kinkela

RE: Lenox China Facility  
Galloway Township, Pomona, Atlantic County

On January 15, 1997, the Department of Environmental Protection received a copy of a letter dated January 13, 1997 which was addressed to you from Richard S. Dovey, President of the Atlantic County Utilities Authority (ACUA). That letter specifies the conditions under which ACUA is willing to accept a temporary discharge of 100,000 gallons per day for a period of ten days from the subject facility incidental to remediation of the site under supervision of the Department's Site Remediation Program.

In lieu of an individual NJPDES/SIU permit for the proposed activity, the Division of Water Quality hereby allows the proposed temporary discharge, as specified in and subject to all conditions set forth in the referenced letter dated January 13, 1997 and conditions incorporated therein from a letter dated November 27, 1996 by Churchill Associates, consulting engineer for the Galloway Township Utilities Division.

Upon expiration of this temporary permission, discharge to ACUA in excess of 25,000 gallons daily may require Lenox to obtain an individual NJPDES/SIU permit.

If you have any questions regarding this matter please contact Nilesh Naik of the Bureau of Pretreatment and Residuals at (609) 633-3823 or by letter through this office.

*Fax 984-7938*

Sincerely,

Dennis Hart, Director  
Division of Water Quality

DWQ181: git

c: Richard P. Dovey, ACUA  
Rick Wehrhan, ACUA  
Steven Bonanni, Galloway Township  
Frank Faranca, NJDEP Division of Responsible Party Site Remediation

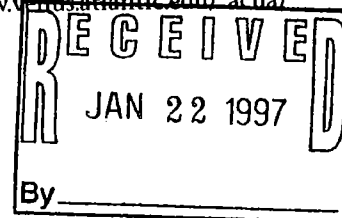


# ACUA

## Atlantic County Utilities Authority

1701 Absecon Blvd. • Atlantic City, New Jersey 08401  
phone: (609) 348-5500 • fax: (609) 343-7760 • WEB: <http://www.vccs.acnj.edu/~acua/>

January 13, 1997



Mr. John Kinkela, Director, Environmental Engineering  
Lenox Inc.  
100 Lenox Drive  
Lawrenceville, NJ 08648

RE: Lenox China  
Temporary Remedial Wastewater Discharge  
Lenox China Facility  
Galloway Township, Pomona, Atlantic County

Dear Mr. Kinkela:

The proposed project involves remediation of contaminated soils at or adjacent to the Lenox China Facility in Pomona, Galloway Township. Prior to excavation and disposal of contaminated soils in accordance with a Remedial Action Work Plan, dewatering of the site is necessary. Because the water is contaminated with lead, connection to the sanitary sewage system and treatment by the ACUA is being proposed.

We have reviewed the above referenced request for temporary discharge into the ACUA sanitary sewerage system. Based upon information provided by your office dated December 2, 1996, this project is expected to contribute 250,000 gallons (initially) of surface water at a rate of 100,000 gallons per day (gpd) and 100,000 gpd of groundwater thereafter for a period of 10 days. The information provided also indicates that the amount of lead in the water is less than 0.6 milligrams per liter. However, according to the support documentation, lead contained in the soil to be excavated contains levels of lead significantly in excess of levels present in the water.

The proposed discharge will be transmitted through the Galloway Township wastewater conveyance system before being discharged into the ACUA system. The Galloway Township Utilities Division has agreed to accept the subject discharge subject to certain provisions outlined by their consulting engineer, Churchill Associates, in a letter dated November 27, 1996.

Because the estimated flow volumes are expected to exceed thresholds that usually require NJDEP Treatment Works Approval (TWA) and Significant Indirect User (SIU) Permits, determinations by ACUA with respect to the proposed discharge are subject to the findings and satisfaction of the Department in this regard.

The Atlantic County Utilities Authority is responsible for enhancing the quality of life through the protection of waters and lands from pollution by providing responsible waste management services. The Authority is an environmental leader and will continue to use new technologies, innovations and employee ideas to provide the highest quality and most cost effective environmental services.



recycled paper

We acknowledge receipt of a letter from the NJDEP Site Remediation Program dated December 11, 1996 that deems the proposed discharge to have a Treatment Works Approval permit equivalent as a result of the work being conducted under the supervision of the Department under the terms of a Memorandum of Agreement. It is our understanding that the SIU Permit is to be addressed following the issuance of an affirmative finding by ACUA. The SIU permit (or equivalent) must be forwarded to ACUA (to the attention of Rick Wehrhan) prior to start of discharge.

In accordance with your letter dated January 9, 1997 in response to our letter dated December 19, 1996, the proposed discharge will be pre-treated to meet the ACUA discharge limits of 0.6 mg/l for lead and between 5 and 9 units for pH. The discharge will be metered, sampled and analyzed daily for total lead, TSS and pH and the results will be transmitted daily to Gary Grant.

Based upon current loadings the temporary discharge to be generated by the referenced project, consisting of surface and ground water, at a rate and for a period specified above, can presently be accommodated by all affected ACUA facilities under the following conditions:

1. The discharge must be metered and cannot exceed 100,000 gpd for a period longer than that specified unless prior written approval is issued by ACUA.
2. The discharge must be sampled and analyzed for Total Lead, Total Suspended Solids (TSS) and pH daily. Total lead and TSS samples are to be 24 hour composites and the pH will be a field analyzed grab.
3. Results of the lab analysis and total flows are to be reported daily to Gary Grant, Assistant Operations Director, via FAX at 344-6609.
4. The following levels are maximum discharge limits that cannot be exceeded:

Total Lead	0.6 Mg/Kg
TSS	500 Mg/Kg
pH	Over 9 or less than 5 standard units

Discharge to be discontinued and ACUA to be notified immediately if and when exceedences occur. Once ACUA is satisfied with corrective action then discharge may resume.

5. ACUA representatives may visit the site at any time without notice to observe the operation and perform confirmatory sampling and analysis activities.

6. Gary Grant or his designee is to be notified (348-5500) at least 72 hours in advance of start of initial discharge and each time the discharge stops or resumes until the project is completed.

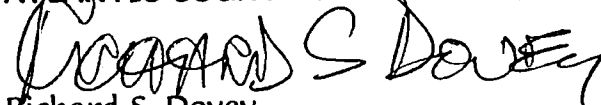
7. The ACUA must review changes in the project that would effect the waste water discharge quality and quantity. In no case may the project discharge exceed ACUA "Schedule B" parameters without prior written authorization from ACUA and NJDEP. Please note that ACUA may require additional measures, such as a sampling plan, to assure compliance with ACUA standards. The ACUA can at any time for any reason discontinue acceptance of the discharge if it is in the ACUA's best interest to do so.

It should be noted that our review is not in regard to engineering detail or conveyance of the flows from the project to the ACUA system. We would rely on the Local Provider and State of New Jersey Department of Environmental Protection for technical review and local sewer service availability.

Should you have any questions, please feel free to contact Rick Wehrhan at 348-5500.

Sincerely yours,

ATLANTIC COUNTY UTILITIES AUTHORITY



Richard S. Dovey  
President

- c: Frank Faranca, NJDEP, Division of Responsible Party Site Remediation  
Nilish Niak, NJDEP, DWQ, Bureau of Pretreatment and Residuals  
Stephen Bonanni, Galloway Township  
Richard Catando, ACUA  
Rick Wehrhan, ACUA  
Bill Hiller, ACUA  
Gary Grant, ACUA  
Tom Ganard, ACUA  
File - lenox.tmp



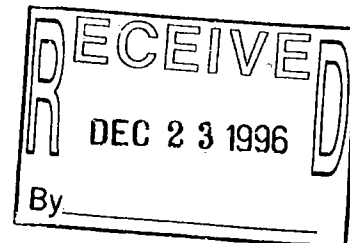
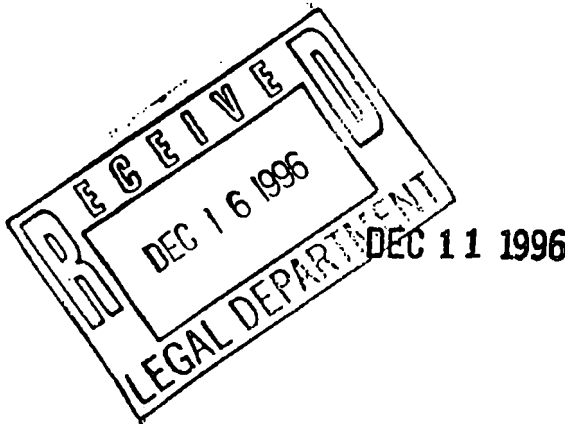
Christine Todd Whitman  
Governor

State of New Jersey  
Department of Environmental Protection

Robert C. Shinn, Jr.  
Commissioner

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED  
NO. 2288 500 890

Mr. Louis A. Fantin, VP  
Lenox Incorporated  
100 Lenox Drive  
Lawrenceville, N.J. 08648



Dear Mr. Fantin:

Re: Lenox China Facility  
Atlantic County Utilities Authority/Treatment Works Approval  
Galloway Township, Atlantic County

The New Jersey Department of Environmental Protection (Department) received a copy of a correspondence from Lenox China, Inc. (Lenox) to the Atlantic County Utilities Authority (ACUA) dated December 2, 1996 regarding the temporary connection for wastewater generated from the remedial activities at the Lenox South Site. The estimated initial volume of water to be removed from an on-site depression will be 250,000 gallons and a daily volume of water thereafter estimated to be 100,000 gallons for the duration of the remedial activity estimated to be 10 working days. This water contains a trace concentration of lead (less than 0.6 mg/l) and therefore can not be reinjected back into the aquifer. It is the Department's understanding that a Treatment Works Approval is necessary for the conveyance system in order for the ACUA to accept this waste water and exceed their current limitation of 8,000 gallons per day per connection. The Director of Public Works for Galloway Township has approved this temporary discharge as to the quantity and quality of the water in their November 27, 1996 correspondence from the Township Engineer.

The Department has reviewed this proposal pursuant to the November 27, 1996 Amendment to the Memorandum of Agreement between the Department and Lenox and has determined that the ACUA and Lenox is deemed to have a Treatment Works Approval for this temporary discharge as a permit equivalent. Lenox and ACUA is also being informed that this permit equivalent is only allowed because the work is being conducted under the supervision of the Department's Site Remediation Program and the above mentioned Memorandum of Agreement.

Should you have any questions, please contact me at (609) 984-4071.

Sincerely,

Frank Faranca, Project Manager  
Bureau of Federal Case Management

c: Andrew Park, USEPA, Region II  
Daryl Clark, NJDEP/DPFSR/BGWPA  
Rick Wehrhan, ACUA  
Todd DeJesus, Pinelands Commission

**CHURCHILL**  
**Consulting Engineers**  
A Professional Corporation

RECEIVED  
NOV 2 1996

November 27, 1996

Corporate Headquarters  
344 South Route 73, Berlin NJ 08009  
Phone 609-767-6901 Fax 609-767-0272  
E-mail amc@interserv.com

Mr. Stephen J. Bonanni, Director of Public Works  
Galloway Township  
300 E. Jimmie Leeds Road  
Galloway, NJ 08201

Re: Lenox China  
Temporary Remedial Wastewater Discharge  
Galloway Township, Atlantic County, NJ  
Our File No. GU96003

Dear Steve:

As requested, we have reviewed Lenox Chinas' proposal to discharge wastewater from their lead remediation project into the Township sewerage system, as set forth in the attached letter of November 22, 1996.

This flow would be pumped into the Aloe Street force main and through the Pomona Pumping Station over a period of about two (2) weeks. Our concerns are two-fold. First, the ability of the station to accept the estimated 100,000 gallons per day of flow is uncertain. Secondly, there is a possibility that the wastewater may contain grit.

We have discussed these concerns with John F. Kinkela, Director of Environmental Engineering of Lenox. Mr. Kinkela agreed to the following:

1. Flow introduced into the system will be reduced (and/or stopped) in the event that a backup of wastewater is observed at the Pomona Pumping Station until such time that normal conditions resume. Mr. Kinkela indicated that the initial pumping would be scheduled over a weekend when the normal Lenox flow is low and that the Township would be provided with a contact for 24-hour response.
2. Lenox will be responsible for any damage to the Township facilities caused by their discharge (i.e. grit damage to pumps, etc.).

Mr. Stephen J. Bonanni, Director of Public Works

November 27, 1996

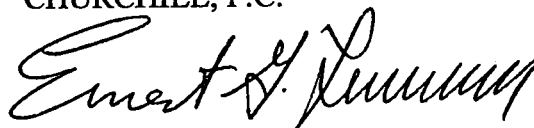
Page 2 of 2

With these conditions, we would have no objection to the Township allowing the temporary discharge.

If you have any questions or require additional information, please feel free to contact our office.

Very truly yours,

CHURCHILL, P.C.

A handwritten signature in cursive script, appearing to read "Ernest G. Lemmerman".

Ernest G. Lemmerman, P.E.  
Project Manager

EGL:dd

Enclosure

cc: Mr. Andrew S. Katz, Township Manager  
Mr. John F. Kinkela, Lenox



**APPENDIX B**

**EXPEDITED FIELD TEST PROCEDURES**

## CLEAN SOIL EVALUATION, SOUTH SITE

The following sampling protocol and test procedures will be used to control final contaminated soil clean up at the South Site. Samples will be collected and analyzed for total lead to determine the amount of soil that must be removed to achieve an acceptable contaminate level.

The area is laid out in 70 ft. square grid sections. The first phase will be to test each grid section to determine the depth of soil that must be scraped off the top to get to a clean soil level.

The second phase will be to determine how the soil must be handled, (disposed of or put back in place), after scraping and screening.

Initial sample locations are indicated on a grid drawing prepared by Gary Berman. Samples will be collected to a depth of 12 inches.

The second phase of testing will be to collect samples from each of the piles generated by the scraping/screening operation. It will be determined at this point whether the screened soil will be removed for disposal or put back in place.

This procedure does not follow standard procedures for total lead analysis. Sample preparation, digestion, filtration and glassware clean up are altered to expedite test data turn-around. This is necessary to keep the flow of work continuous from one grid section to the next..

### SAMPLE COLLECTION

#### 1.0 Preparing Split Spoon Sampler

Scrub Split Spoon Sampler with tap water, then rinse with DI water.

\*Note: This procedure shall be followed prior to collecting each sample.

#### 2.0 Collecting sample

- 2.1 Position a barrier ring so that the split spoon sampler will penetrate the ground surface in the center of the ring. Measure and record the average depth of the dirty soil.
- 2.2 Remove all dirty soil and loose dirt from inside the ring.
- 2.3 Place point of split spoon in center of ringed area and carefully drive to a depth of 12 inches.
- 2.4 Remove split spoon sampler, place on a clean surface and open. Take care that all material remains in place in the split spoon.
- 2.5 Put the top 3 inch section of the sample from the split spoon into a container and mark for identification.
- 2.6 Repeat step 2.5 above to collect the next 3 inch and 6 inch sections.

The collected samples are now ready for analysis. The top 3 inch section will be analyzed first. If this sample does not show clean soil results, the next 3 inch section shall be analyzed. If this sample also does not show clean soil, analyze the last 6 inch sample section. The results of this sample will determine whether sampling at a deeper depth will be necessary or how to handle the soil in this pile of screened material.

## SAMPLE ANALYSIS PROCEDURE

### 1.0 Sample preparation

- 1.1 Thoroughly mix collected sample.  
\*Note: Sample will be wet and may need to be chopped up for mixing.
- 1.2 Spread sample out and quarter. Take equal amounts from each quarter to provide at least a 100 gram sample.
- 1.3 Spread out the 100 gram sample and quarter.
- 1.4 Take equal amounts from each quarter to provide an approximately 5,000 milligram sample and place in a 125 ml Phillips Beaker. Record the actual weight (W).

### 2.0 Clean Glassware

- 2.1 Glassware shall be washed with Lab detergent, rinsed with tap water and a final rinse with DI water.

### 3.0 Hot Nitric Acid Digestion and preparation of sample for reading on AA.

- 3.1 Add 15 ml of concentrated nitric acid to sample in 125 ml Phillips beaker.
- 3.2 Heat sample gently on a hot plate for 30 minutes. Remove from heat and let cool.
- 3.3 Bring initial volume ( $V_i$ ) of sample up to 0.1L (100 ml) with DI water. MIX THOROUGHLY and let stand to settle.
- 3.4 Decant digested solution through a 0.45 micron filter. DO NOT wash sediment into filter.
- 3.5 Put a 10 ml aliquot of filtrate ( $V_F$ ) into a 50 ml ( $V_1$ ) volumetric flask to make a 5:1 dilution. (This 5X dilution puts a sample with 100 to 800 ppm of total lead in range for an AA calibrated with 1 mg/l to 8 mg/l calibration standards.)

### 4.0 Sample analysis by "AA"

- 4.1 Sample shall be analyzed on the Atomic Absorption Flame Spectrometer following standard procedures for lead analysis.
- 4.2 If the reading (R) is high (greater than 8.0 mg/L), then the sample must be diluted 10:1 or 5:1, using DI water, to bring it within the spectrometer's working sensitivity range. For each dilution (N), record both the aliquot ( $V_{AN}$ ) and dilution ( $V_{(N+1)}$ ) volumes.

## 5.0 Calculation of final Sample Concentration

- 5.1 If the initial sample from step 3.5 was read on the AA without further dilutions then the dilution factor (DF) is:

$$DF = 5 = V_1/F_v; \text{ where } V_1 = \text{dilution volume, } F_v = \text{volume of filtrate.} \\ = 50 \text{ ml}/10 \text{ ml.}$$

- 5.2 If it was necessary to make additional dilutions to obtain an AA reading in the calibration range, the final dilution factor is calculated by multiplying dilution factors.

$$DF = V_1/F_v * V_2/V_{A1} * V_3/V_{A2} * \dots * V_{(n+1)}/V_{An}$$

where:  $V_1/F_v = 5$  from the dilution in step 3.5

$V_{An}$  = volume of aliquot taken from dilution volume  $V_1$

$V_N$  = volume of final dilution step N.

- 5.3 Calculate the final Sample Concentration (C) in the fully diluted AA sample which gave the final AA reading.

$$C = W/(V_1 * DF) \\ = (100 \text{ ml} * DF)$$

where W = the weight of the original sample from step 1.4 and DF is taken from either step 5.1 or step 5.2, as appropriate.

(e.g. for 5.1)

$$C = 5,000 \text{ mg}/(100 \text{ ml} * 5) = 1,000 \text{ mg}/0.1 \text{ L} = 10,000 \text{ mg/L}$$

## 6.0 Calculation of Test Results

- 6.1 The "AA" reading is in units of mg/L based on the standard calibration curve used for lead analysis.
- 6.2 The results are used to back calculate the total lead concentration (X) in the original 5,000 milligram sample using the following formula:

$$X = R/C * 10^6/10^6 = \text{concentration of lead in the soil sample in parts per million (ppm);}$$

where: R = AA reading in mg/L from step 4.0;

C = concentration of the original sample in the fully diluted digestion sample from step 5.3.

e.g. if R = 5 mg/L and C = 10,000 mg/L then the mg/L's cancel out and:

$$X = R/C * 10^6/10^6 = (5 * 10^6) / (10^4 * 10^6) = (5 * 10^2) / 10^6 = 500 \text{ ppm.}$$

## **APPENDIX C**

### **GEO-PROBE ANALYTICAL RESULTS AND METHODOLOGY**

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**APPENDIX C**

**GROUNDWATER SAMPLING PROCEDURES**

Gannett Fleming retained Zebra Environmental to collect groundwater samples using Geoprobe direct push equipment. The site investigation work was supervised by Mary Redican, a Gannett Fleming Engineer, and Daryl Clark, an NJDEP Project Geologist.

Groundwater samples were collected by inserting stainless steel screen and food grade Tygon tubing into the outer drive casing, driving the outer casing to approximately 14 feet below grade (depth to groundwater was anticipated to be approximately 12 feet below grade). The outer casing was pulled back to expose the 6-inch section of screen. A peristaltic pump was used to purge a small volume of water until a relatively clear discharge was obtained. The groundwater samples were collected directly from the pump discharge tubing into sample containers provided by the laboratory.

The equipment was cleaned between borings by removing soil using a wire brush, washing the casing and screen with Alconox and potable water, rinsing with potable water and rinsing with distilled water. Dedicated Tygon tubing was used for each groundwater sample.

## GEO-PROBE - ANALYTICAL RESULTS

Sample number	AccuTest Sample #	Accutest Results	In-house Test (ppm)	Date Collected	Sample Description
GP-1	E39740-5	NA	0.0190	09/21/98	Geoprobe Lead and VOC samples
GP-1A	E39740-6	<.0030	<.0020	09/21/98	Geoprobe Lead and VOC samples
GP-2	E39740-3	0.0053	0.0031	09/21/98	Geoprobe Lead and VOC samples
GP-3	E39740-2	<.0030	<.0020	09/21/98	Geoprobe Lead and VOC samples
GP-4	E39740-1	<.0030	0.0028	09/21/98	Geoprobe Lead and VOC samples
FIELD BLANK	E39740-4	<.0030	NA		
TRIP BLANK	E39740-7	NA	NA		